M/027/008

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
RICHFIELD DISTRICT OFFICE
150 EAST 900 NORTH
RICHFIELD, UTAH 84701

IN REPLY
REFER TO:

1791
(U-050)

August 20, 1987

Dear Reader:

Attached for your review and comment is the W.D. Haden Development Plan for Sevier Lake Environmental Assessment. If you wish to comment please reply by - September 4, 1987, and send the comments to:

Donald L. Pendleton
Bureau of Land Management
Richfield District Office
150 East 900 North
Richfield, Utah 84701

Sincerely,

Donald L. Pendleton

Donald L. Pendleton
District Manager

Attachment
W.D. Haden EA

EA # UT050-87-080

W. D. Haden Development Plan for Sevier Lake

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Recommended by:

Don Burt — Area Manager — Date 7-23-87

Thomas A Terry — Area Coordinator — Date 7-23-87

Reviewed by:

[signature] — Asst. D.M. Resources — Date 8/19/87

Roy Edmonds — acting Asst. D.M. PEA — Date 8/19/87

Approved by:

District Manager — Date

A. BACKGROUND

Sevier Lake is a terminal lake which is normally dry, located in Millard County, Utah. Geological exploration of the lake bed has shown it to contain large quantities of potassium-bearing saline brines. In many ways, the brines resemble those of either oceanic origin or related remnants of Lake Bonneville. Processing of similar brines to high quality potassium products has been practiced commercially for many years at different locations around the world. The brine reserve, coupled with the meteorological and topographic conditions found at Sevier Lake, make the site a viable location from which to produce potassium and associated minerals.

Studies demonstrate the essential need for use of the entire Sevier Lake basin in the operation, both to collect subsurface brines and to provide area for large scale solar ponds. The total area required for an economically sized potash facility is in excess of 100,000 acres, or roughly equivalent to the operating areas of similar operations in Utah at Wendover and on the Great Salt Lake.

The W. D. Haden Company, et al, also known as Crystal Peak Minerals, have been doing minerals exploration in and around Sevier Dry Lake for the past several years. On November 1, 1983, BLM issued 53 prospecting permits to explore for potassium in Townships 20, 21, 22, 23, and 24 South, Ranges 11 and 12 West, on what is called Sevier Lake. Two year extensions to each prospecting permit were approved on February 5, 1986.

On March 3, 1986, M. C. Godbe (a consultant to W.D. Haden) submitted a mining plan to construct a dike from T. 22 S., R. 12 W., Sec. 14 to T. 22 S., R. 11 W., Sec. 29 or Sec. 33. On August 6, 1986 a permit was issued to construct the proposed Needle Point dike but, to date, the dike has not been constructed.

On February 4, 1987, W. D. Haden submitted a plan of operation to construct a containment dike in T. 24 S., R. 12 W. Sec. 4, 9, 10, and 15. This proposal was submitted under the 43 CFR 3809 Regulations, and the proposed work would be applied toward meeting the required mining claim assessment work for 1987. BLM approved the 3809 submission on April 10, 1987, and this dike was completed in July, 1987. The containment dike isolates the first water evaporation pond and research source for salts production.

B. PURPOSE AND NEED

Potassium is a product which is used as a soil conditioner (fertilizer) in agriculture to significantly increase crop production. Sevier Lake is one of a very few possible commercially viable potassium reserves in the nation. The U.S. Bureau of Mines estimated that approximately 70% of domestic consumption is currently imported. Further, it is estimated the U.S. Reserves have fallen to a supply of less than ten years. Many of the listed reserves are either prone to flooding or are subject to high recovery costs. The Sevier Lake reserves appear to be economically recoverable, and quite accessible.

Another product from the Lake would be salt. The salt would be used for water treatment (for water softeners), clearing ice from roads, and for agricultural uses (livestock salt).

A by-product of the potassium/salt extraction is magnesium chloride brine. Magnesium chloride is used as dust suppressant on dirt roads. When magnesium chloride is sprayed on dirt roads, it forms a hard surface which prevents dust from coming from the road.

C. PROPOSED ACTION

W. D. Haden proposes to develop a potassium sulfate processing plant with all needed ancillary facilities. Potash would be recovered by placing lake bed brine into large ponds, and reducing the water volume by solar evaporation (see Photo #1). Once most of the water is evaporated, the "potash minerals" would be harvested using heavy equipment, then it would be processed into potassium sulfate. The various parts of the development will be described in component groups.

1. Solar Ponds

Wet Lake Scenario

If the Lake stays high, the proposed Needle Point Dike would be the north dike forming a preconcentration pond (see Fig. 1). This pond would cover about 45 square miles. This preconcentration pond would also serve as a holding or storage pond for the salt recovery ponds. When brine is needed in the salt recovery ponds, it would be pumped (see Pump one on Fig. 1), from the preconcentration pond.

The salt concentration ponds are shallow bermed areas which create the ponds. The high surface area and shallow water level combined with the dry sunny climate of Southern Utah provides high evaporation rates which are conducive to the process. As water evaporates, the minerals in the saline brine are concentrated. Soon the salt starts to precipitate or fall to the bottom of the pond, forming crystals. Once a thick layer has precipitated on the pond bottom, the remaining brine is removed, and after the salt has partially dried, it is harvested.

The remaining brine is moved into a potash recovery pond; again, the water evaporates and the potassium mineral precipitates along the pond bottom. The remaining brine is removed, so the potash can dry and be harvested (see Fig. 2).

The remnant water has had most of the salt and potassium removed, but it is rich in magnesium chloride. The magnesium chloride is moved into a holding pond where it will be sold as a dust suppressant for roads.

There would be eight concentration ponds and they would cover about 11 square miles. The brine would be pumped into the concentration ponds from the preconcentration pond, but the brine would gravity-flow from the salt ponds into the salt and potassium harvest ponds. The brine levels in the gravity flow system would be controlled by wooden weir structures.

There would be 12 harvest ponds which would cover about six square miles. The residual brine from the potassium process would flow "into the magnesium chloride pond". The magnesium chloride pond would be about .75 of a square mile (see Fig. 1).

Dry Lake Scenario

If the lake returns to its pre-1983 levels, it will again become a dry lake playa. To extract salts from the dry lake bed, the Haden group would have to use a different operation. Haden has proposed the construction of a canal system which would carry the mineral-rich brine contained in the upper portion of the lake bed playa from the extreme north end of the lake to the south end for evaporation and processing.

This ditch system would consist of two ditches, each 11 miles long in T. 20, 21, and 22. In T. 22, the two ditches would join and flow in one ditch in T. 22 and 23 down to the primary pond dike; this single ditch would be 10 miles long. The total canal system, collection and delivery ditches, would be about 35 miles long. The ditches would be 20 to 30 feet wide and 20 to 30 feet deep. The ditch brine would be pumped into the first salt concentration pond, but there would not be water in the preconcentration pond. The first pond would act as a mineral-rich brine source, or holding pond, for the other solar evaporation salt ponds. Once the salt brine enters the preconcentration system, it would be treated the same as described under the wet lake scenario (see Figs. 1 and 2).

Flood Scenario

If the lake reaches flood levels, water levels higher than 1983-1984, the preconcentration pond would be flooded. In this case, the Haden group proposed to drill some brine extraction wells. The wells would be about 250 feet deep. The well brine would be pumped directly into the salt ponds, and the evaporation process and dikes would be the same as the above-described process.

Ponds and Dikes

The solar ponds would be the first phase of the project. The process of solar dewatering the salts takes several years, thus the first dike was constructed in 1987 to research and observe the dewatering process. The material to construct the new dikes would come from the lake bottom clays and from three borrow pits around the lake. The borrow material would be screened, and the rocks would be used as rip-rap on the outside of the dikes. Once salt starts to precipitate from the water it would form a hard floor in the ponds. This floor would be used as a working surface for harvesting equipment. The pond floors would be level and the dike would be five to eight feet above the floor. The dikes would be 10 to 30 feet wide at the crest and be built with a 4:1 slope.

Borrow Areas

There are three proposed borrow areas in T. 24 S., R. 12 W., Sec. 16; T. 22 S., R. 11 W., Sec. 32; and T. 22 S., R. 11 W., Sec. 32. About 300,000 cubic yards of material would be loaded with a front-end loader, hauled in a dump truck to the dike construction area. The material would be dumped onto the dike then pushed into the water with a tractor. About 1,000,000 yards of lake bottom silty clay would be moved with a drag line to build interior harvest dikes. As the exterior dikes are damaged by water action, more material would be hauled to the dike for repair, about 10,000 yards are needed each year. The materials would be purchased from the State of Utah, and borrow material taken from BLM land outside the mineral claims would be bought from BLM.

Processing Plant

The processing plant and raw material stockpiles would occupy the south half of Sec. 16, T. 24 S., R. 12 W., a State of Utah section under lease (see Fig. 4). The stockpile area would occupy 77 acres, 40 acres for the salt pile and 37 acres for the potash pile (see Photo #2). The stockpile area would be surrounded by 15-foot high containment berms. Water which runs off the stockpile area would be pumped back into a salt pond to be re-cycled (see Fig. 1). The water would be removed by two 500 gallon/minute pumps which would be located on the north edge of the stockpile area.

A salt washing station would be located on the north port of the 40-acre salt stockpile area (see Fig. 2). The equipment required would be an elevated truck hopper, a submerged drag feeder, two 4 ft. x 16 ft. vibratory screen shakers, and two 60-ft. stacking conveyors. The processing plant and ancillary facilities are shown in (Fig. 3).

Salt Drying, Bagging Plant

The salt plant would measure approximately 100 ft. x 200 ft. x 50 ft.. The structure would enclose all the plant units except for feed conveyor, and rotary dryer. The feed conveyer would be approximately 400 ft. long. The rotary dryer would be of standard construction with a probable shell size of 8 ft. x 40 ft.. The major enclosed unit operations would include bucket elevators, screens, dust collection systems and scrubbers, product bins, bagging lines, and loading docks (see Photo #3 and Fig. 4).

Salt Warehouse/Loadout

The salt warehouse would be a single story structure attached to the salt plant. It would enclose approximately 20,000 square feet. Its use would be primarily to store bagged salt. Additional loading docks would be enclosed in the structure (see Photo #3).

Salt Plant Parking Lot

A 200 ft. x 400 ft. graveled parking lot would be built south of the salt plant for truck and employee parking.

Gravel Pit

A ten-acre borrow area would be located in the southeastern section of the plant site to provide material for solar pond dike maintenance and road materials.

Potash Plant

The potash plant structure would measure approximately 100 ft. x 300 ft.. It would be 50 ft. tall. Its use would be to enclose all required process equipment with the exceptions of thickeners, rotary dryers, feed conveyors, and product conveyors. Major enclosed equipment would include crushers, crystallizers, pumps, heat exchangers, filtration equipment, and electrical motor control centers. The feed belt conveyor would be about 300 ft. in length. The rotary dryer shell size would be 8 ft. x 40 ft.. The product from the dryer would be conveyed to the product storage buildings by a covered belt conveyor of approximately 200 ft. in length.

The dust particle emission controls, wet venturi scrubbers, would collect 99.75% of all particles produced by this operation (see Photo #3 and Fig. 5).

Thickeners

Two 90-ft. diameter thickeners used in the potash process would be located adjacent to the potash processing plant. These two large tanks would have a height of about 15 feet.

Potash Bulk Storage/Loadout

Two 200-ft. diameter concrete domes would be constructed for potash product storage. The domes would have a height of 40 feet. Product load-out from the domes would be to an adjacent station equipped with truck scales. The product would be conveyed by means of a belt conveyer and a bucket elevator.

Potash Plant Parking Lot

A 200 ft. x 400 ft. parking lot will be leveled and graveled adjacent to the potash plant to provide both employee and truck parking.

Office Parking Lot

A 100 ft. x 300 ft. parking lot adjacent to the office building will be leveled and graveled to provide parking for visitors and office staff.

Office/Maintenance/Technical Services Building

A 200 ft. x 50 ft. single story building would be built to house the office staff, analytical laboratory, plant maintenance, supply warehouse, and employee changeroom. All structures and components at the plant site would be painted with earth tone colors to minimize the contrast of the plant with the surrounding terrain. In addition, careful attention would be made during the final design stage to meet all building code, safety, zoning, and environmental regulations. Except where noted, construction method would be steel frame, with either sheet metal or wood panel exteriors.

Power Substation

A 100 ft. x 100 ft. fenced area would be provided to site the primary plant electrical substation at the terminus of the 46 kV powerline.

Propane Storage

Two 10,000 gallon propane storage tanks would be located at the site to provide ample supply of propane for processing requirements. All fuel storage and supply lines would be built above ground. The fuel tanks would be located far enough from other structures so fuel leak would not endanger them.

Sewage Treatment and Lagoon

A zero discharge sewage treatment system would be built. The system would process only sanitary sewage. The size of the required lagoon would

be less than two acres. The system would be permitted and regulated by the Utah State Department of Health.

The sewage lagoon would be fenced to protect people and animals.

Water Treatment Plant

A small 200 square foot building would be built to house potable water purification and treatment equipment. The exact nature of the equipment will be dependent on the water quality obtained from the proposed water well field.

Water Tank

A 200,000 gallon water tank would be located on the southern edge of the plant site. The tank would have a diameter of 30 ft. and a height of 40 ft..

Mobile Equipment Shop

A four-bay mobile equipment shop with attached office would be built to provide space to repair and service project equipment. It would measure about 100 ft. x 50 ft., the height of the building would be approximately 25 feet.

Fuel Tank

A 20,000 gallon diesel tank and a 10,000 gallon gasoline tank would be located south of the mobile equipment shop to provide fuel storage for the project. The cylindrical tanks would be located above ground in a contained area in accordance to EPA and fire safety regulations.

The fuel tank area would have a berm around it to contain all fuel in the event of a leak.

Sanitary Landfill

A five-acre sanitary landfill would be built in the southwest corner of the plant site. The area would be prepared by first using the area as a borrow site during pond construction. All EPA regulations pertaining to sanitary landfills would be met.

Ancillary Facilities

In order to make the facility operate, other facilities located off the proposed area are required.

The processing plant would be located in T. 24 S., R. 12 W., Sec. 16, and this Section is State of Utah land under lease. W. D. Haden has leased the land from the State for 51 years, and they are negotiating to buy the property.

In order to transport the finished product, potassium and salt, loading facilities would be needed. There would be a truck loading dock at the plant. A minor amount of bagged material would be loaded onto trucks and shipped by highway to the consumer. The majority of the product would be shipped in bulk. The bulk material would be loaded onto tractor trucks and hauled to the railroad loading dock at Black Rock. W. D. Haden has bought 114 acres at the railroad siding next to Highway 257. The railroad loadout would have truck dumping station, a belt conveyor system, a bucket elevator and a loader (see Fig. 6).

A well field would be constructed in T. 24 S., R. 14 W., Sec. 21, 22, and 23. There would be 10 wells and they would be 12" cased 200 feet deep. The water would be used as process water in the plant and the water would

be carried in a pipeline to the plant. The pipeline would be 2.5 miles long, and 15 inches in diameter. The right-of-way would be 20 feet wide. BLM would need to consider a right-of-way for the well field and pipeline (see Fig. 7).

Linear Facilities

Powerline

W. D. Haden would need a 46 kV powerline. The nearest source of this much power is Milford. Thus, a 26.5 mile powerline would be constructed from Milford to the plant site. This powerline would be constructed with about 42-inch spacing between phases, to prevent eagle electrocutions. A pad mount transformer (substation) would also be needed at the plant site. The right-of-way for the line would be 30 feet wide. Utah Power and Light would apply for the powerline right-of-way, and BLM would consider the application (see Fig. 7).

Access Road

The access road to the plant would be along the existing Black Rock to Garrison Road. Thirteen miles of County road from U-257 to the plant would need to be widened to a running surface of 30 feet with a 50-foot right-of-way. The road would need three turns realigned in the pass. An existing 1.6 mile, two-track, County road to the edge of Sevier Lake would need upgrading to a 30-foot running surface. These roads would be constructed for the County (see Fig. 7), and a right-of-way for a 14.6 mile road would be issued to the County. About 100,000 yards of fill material would be taken from an existing BLM borrow pit in which the county has a mineral material permit to upgrade the road.

Roads to Dikes

The Needle Point Dike and the Primary Pond Dike roads are outside the processing site and need a right-of-way. The roads would be in:

T. 23 S., R. 11 W., Sec. 33	1/8 mile
T. 24 S., R. 11 W., Sec. 6	1/4 mile
T. 22 S., R. 11 W., Sec. 33	1-1/4 mile
T. 22 S., R. 11 W., Sec. 34	3/4 mile

These roads exist as primitive roads, but they are not suitable for heavy construction traffic. These roads would have a 20-foot running surface. The borrow material for these roads would come from the borrow pits on State land. The right-of-way would be issued to W. D. Haden (see Fig. 7).

Employment Requirements

During dike and pond construction, a peak work force of about 75 workers would be needed. The workers would be employed in heavy earth moving.

There would be a finished pond and dike system for over two years before the next phase of construction would start. During the no construction time, the salt-bearing brine would be used to build the floors in the ponds, but there would not be any product harvest.

The second phase of construction would be building the processing plant. Construction of the processing facilities would require a peak work force of about 90 workers. These workers would build the structures and install the equipment for the plant.

Once the plant is finished, about 200 workers would be trained to operate the salt extraction equipment.

ALTERNATIVE

No action - Do not allow W. D. Haden to construct the proposed operation.

D. DESCRIPTION OF THE EXISTING ENVIRONMENT

1. Non-Living Components

a. Climate

The climate of the region is best characterized as a high latitude steppe with desert conditions prevailing. Rainfall averages between 5-8 inches per year. Prevailing winds are from the southwest. Temperatures in the region vary from -20^{o} to 110^{o}F.

b. Air Quality

The air quality is in pristine condition, free from effects caused by industrial or commercial development The only industrial emission is 36 miles away; IPP, near Delta, and Continental lime about 20 miles away.

c. Soil

The Bench areas located above the shores of the lake, where most of the proposed developments would be located, contain soils of the Dera-Sanpete-Spager families association. This association of soils is characterized by soils that are shallow to deep, well drained, gently to strongly sloping on alluvial fans and bajadas. Generally, about 50% of the surface is covered with pebbles and cobbles. The surface layer is

loam or sandy loam which is gravelly in most places. The subsoil is gravelly to very gravelly with loam to sandy loam textures and is salt and alkali affected in some areas.

d. Water Quality

1). Surface Water

The water in Sevier Lake is very high in dissolved solids, mostly salts, and the concentrations are so high that the water is of no culinary or agriculture value.

2). Subsurface Water

The subsurface brines contain mineral reserves to be utilized by the project.

2. Living Components

a. Vegetation

The vegetation above the high water line (there is no vegetation in the lake) at the lake is mostly Indian ricegrass, shadscale, fourwing saltbush and some horsebrush. The plant community along the powerline and roads is the same as near the lake. A T&E plant clearance was done on July 1, 1987; no T&E plants were found (see attached report for a detailed list of plants).

b. Wildlife

Sevier Lake has not provided many benefits to wildlife. But, with the flooding of the lake, a community of brine flies and shrimp is

developing. Several species of shorebirds are taking advantage of these food sources, and some nesting is occurring.

Wildlife species near the lake consist of antelope, shore birds, rodents and reptiles. There are a few brine shrimp and flies living in the water. There are some residing golden eagles and wintering bald eagles in the Black Rock Pass area. There are no other T&E animals known in the area of the plant or associated facilities.

c. Livestock Grazing

The proposed site is in the Crystal Peak, Wheeler and Cricket Allotments, which are sheep allotments. There is very little water available and limited forage so there is virtually no livestock grazing at the proposed development site.

3. Human Values

a. Recreation

Sevier Lake is very isolated, and the nearest highway is Highway 50 and 6. There are no other major highways near the proposed assessment site, and the nearest community is Delta 36 miles to the northeast with Milford about 40 miles to the south.

Sevier Dry Lake has historically been a shallow (less than 16 ft. deep) lake in the winter and a dry lake bed in the summer. Recreation use has been limited to occasional visits off Highway 50 & 6 (1/4 to 2 miles north of the lake) to the lake shore for viewing the large lake bed which is up to 12 miles wide and 26 miles long. Access to the lake is limited to a few jeep trails around the periphery of the lake. There has been no traditional recreation on the lake due to the dry conditions during the summer months.

The last few years, the one-hundred year high moisture in terms of snow fall and rainstorms has occurred. This has caused severe flooding throughout the watersheds that feed the Sevier River. As a result, Sevier Lake has reached its historical high, becoming Utah's second largest body of water. This has increased some use adjacent to Highway 50 & 6 for sightseeing, occasional swimming in the salty water. The use, however, is still relatively low.

b. Visual Resources

The area is characterized by broad open valleys bordered by alluvial fans leading down from hills and mountains to the east and west. Vegetation in the valley and hills consists of low-growing vegetation with a few juniper trees interspaced at higher elevations. The Sevier Dry Lake and immediate surrounding area is essentially in a natural state with the exception of a few gravel roads and jeep trails and the AT&T deflector structures located systematically along the north end of the lake. The area was rated as Class C Scenery due to the scarcity of vegetation and relatively flat terrain with generally muted tones with little variety in color. The lake is, however, quite distinctive due to its large size. The area is classified as a VRM Class IV area. The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention.

c. Social and Economic

The proposed construction site is not in a WSA.

The communities of Milford, Beaver, Kanosh, Fillmore and Delta have experienced recent economic downturns which has resulted in a ready supply of skilled workers for plant construction and operation. The present unemployment rate in Beaver County is 5.8 percent and in Millard County it is 7.5 percent, so there are many skilled workers available in the work force.

Much of the unemployment is related to the recently completed IPP project in Delta. Many of the workers were commuter or relocated workers, about 75 to 80 percent, but the remaining 20 to 25 percent were local workers. This means there are at least 125 skilled construction workers looking for work in Millard County.

The estimated population in Beaver County is 5,050 in 1985 (BEBR) and in Millard County it is 10,040 in 1987 (Paul Nelson Associates).

d. Cultural Resources

A cultural resource inventory was done July 9, 1987 along the road. Three significant cultural sites were found in T. 24 S., R. 10 W., Sections 20, 21, and 22. The sites were surface lithic scatters. Since the sites are insignificant, they will not receive any further analysis. The other components of the project were inventoried and no cultural values were found at the proposed plant site, borrow areas, well field and water pipeline. The access roads and dike areas were cleared earlier by the State of Utah. A cultural resource inventory has not been completed for the powerline.

e. Land Use

The lake bottom and south end of the lake are very salty and are only used by a few wild animals, a very limited number of livestock and an occasional outdoor recreation activity. This action is in conformance with the Warm Springs RMP.

E. ANALYSIS OF THE PROPOSED ACTION AND ALTERNATIVES

1. Proposed Action

a. Environmental Impacts

1). Non-Living Components

a). Climate

There would not be any change in the general climate if the desalination plant is built, but there would be more humidity near the pond system. During the winter, there may be some fog near the lake bed.

b.) Air Quality

While material is being taken from the borrow pits to the dike construction or repair, some fugitive dust would be emitted in the borrow pit and along the road. There would also be dust from the plant and powerline construction. During plant operation, there would be a great deal of dust caused when the potash is dried. The wet venturi scrubbers would remove 99.75% of the dust from the air train. The remaining dust which would be released into the air would be about 40 ton/year. Other than particulates, the gas dryers would be nearly pollution-free. There would be a great deal of dust along the haul road from the plant to highway U-257 since there would be 70 round truck trips per day. The other surface disturbance in and around the plant would be dusty.

c.) Soil

Lake bed sediments would be dug from the lake bottom with a drag line. About 157 acres would be disturbed. This material would be used as interior dike material and the result would be trenches in the lake bottom. The trenches would quickly fill in with mud and salt as they are filled with water. Since the soil is quite salt-rich, it would cake and form a fairly hard dust-free surface. Exterior dikes would be built with lake sediments and borrow material from the lake shore; about 16 acres would be disturbed by the lake sediments removal. The outer dikes would be armored with rip-rap on the northern exposure which would protect them from washing away and reduce dust. As the salt is mined from the lake bed, there would be less salt in the soil. Estimated annual extraction of soluble salts would be 100,000 tons/year of potassium sulfate and 400,000 tons/year of common salt.

d.) Water Quality

Surface Water

Surface water would continue to be highly salt saturated, because the water would leach the salts from the soils. It would take at least 50 years before a measurable salt loss would occur. Even after 50 plus years of salt mining, the water would be too salty to be used for agriculture.

Subsurface Water

The ground water would be less salty after 50 plus years, but the ground water would still be very salty. Water which would be pumped for process water would be very hard, but it should be suitable for plant operation. Since the wells have not been drilled, there is no data to indicate the affects that pumping would have on the aquifer.

When/if the lake returns to its usual dry lake status, drain ditches would remove the subsurface water for solar evaporation. This subsurface water should not change the hydrological regime of the lake since an estimated 60,000 acre-feet of subsurface water enters the lake each year. 38,000 afm Both surface and subsurface inflows to the lake would continue to be balanced by direct evaporation off of surface waters and by evapotranspiration from the mud surfaces.

2). Living Components

a). Vegetation

As the various parts of the plant and dikes are built, all vegetation would be killed at the work site. The following table shows the number of acres of land where all vegetation would be removed.

COMPONENT	ACRES
Black Rock Road	79
Plant Access Road	10.3
Plant Site*	320
Powerline	96
Well Field and Pipeline	12
East Side Roads & Borrow Areas	16
Black Rock Loadout**	114
Ditch System***	200
Dike System***	157

*The plant site in Sec. 16, a State of Utah Section.

**Black Rock load out is an existing railroad spur. Union Pacific built the spur many years ago, but sold the land to W.D. Haden in 1986. Surface disturbance occurred when the spur was built, and Haden would simply clean up the spur area.

***Lake bed with no vegetation.

Once the vegetation has been removed, a total of about 890 acres of land would be ready for construction of the various structures. With the vegetation removed, the soil would be open to wind and water erosion. The cleared soil would also be open to invasion by undesirable plant species such as halogeton and cheatgrass.

When the powerline is built, there would be an access road (two-wheel ruts) along the right-of-way, and there would be a spot at each structure where the equipment would crush vegetation as the powerpole is assembled and erected. The vehicle trail would be about 10 feet wide and 26.5 miles long. The structure pad disturbance would be about 50 feet in diameter and there would be about 12 structures per mile.

b). Wildlife

With continuation of open water in the proposed impoundments, the food sources should continue to develop, at least in the less saturated brine impoundments. It would be anticipated that more

shorebirds and other water-related birds would begin using this developing habitat in the future. If the rest of the lake dries up, these permanent ponds could become a valuable shorebird and waterfowl habitat.

Assuming no toxic situations develop in the concentration ponds, it would be anticipated that the proposed development would be beneficial to shorebirds and other water-related birds and some small mammals, at least around the less saturated brine ponds.

If all safety and sanitation procedures alluded to in the project proposal are adhered to, there should be no negative impacts to wildlife.

Traffic along this road will increase tremendously and be nearly continuous during daylight hours. Up to 200 workers will be commuting morning and evening and haul trucks will make up to 70 trips a day between the plant site and the Black Rock Siding. This traffic will definitely impact wildlife use along the travel corridor. Road kills will definitely increase. Most road kills would be expected to be in the small mammal and bird species. The effect would not be expected to be significant except in the immediate vicinity of the corridor.

Antelope would probably be displaced due to the continuous activity. The road passes through critical antelope habitat for nearly two miles on the east side of Black Rock Pass. Use of this

Overall, this area is fairly lightly used so the total number of antelope displaced would be small. The negative effects would be small. The negative affects would be relatively local to the immediate area and should not affect the whole herd's use significantly.

Eagles which use the rock perch in Black Rock Pass would be displaced by the road traffic. Some of these eagles are Bald Eagles and the impacts of displacing the bald eagle is difficult to assess, but it is probably not significant.

The other road construction (east side) and dike should not significantly affect wildlife, but antelope would temporarily be displaced during construction.

Powerline construction would not affect wildlife, but the finished structures would be used by the displaced eagles and other raptors as perches.

c. Human Values

1). Recreation

The project would have limited impact on the visitation to the lakeshore and other related activities that take place adjacent to Highway 50 & 6. The project, however, may hasten the lower level of the lake, thus precluding the small amount of swimming that takes place.

2). Visual Resources

The natural character of the lake would be significantly impacted if the entire project were implemented. The primary impact,

as viewed from Highway 50 & 6 would be the unnatural linear features caused by the dikes and drain ditches. The primary project area at the southern half of the lake would not be as visible since it would be 15 or more miles from the road and would, therefore, be in the background distance zone. The primary project area would be quite visible when first viewed coming west through the east pass on the Black Rock Road, but would be as visible while traveling along this road due to the flatter terrain sloping slightly to the lake. This road, however, receives light vehicular use.

3). Social and Economics

The communities of Milford, Beaver, Kanosh, Fillmore, and Delta would benefit from an increase in construction jobs. As the ponds and dikes are built, there would be 75 heavy construction jobs with a total income for the area of $1,000,000. The construction crew for the plant and related facilities would provide a total income of $2,700,000. Some of this income would be paid to skilled workers from other areas, but an estimated 80 percent would be paid to local employees.

The 200 plant operators would live in the Millard/Beaver County area and most of their income would be available to spend in the local economy. The estimated total annual salary for plant operations is $5,600,000.

No population change is anticipated if the proposed plant is built, because most, if not all, the potential employees are in the

Millard/Beaver County area. Most of the construction workers living in the two counties are skilled and could step into the work at the proposed action. Skilled operations workers trained in solar salt extraction are not presently available, but Haden plans to train local operators for the operation.

d). Cultural Resources

No cultural impacts are anticipated since partial clearance was done, but subsurface values could be in the vicinity.

e). Land Use

The proposed action does not conflict with any other land use or water use.

2. Mitigating Measures

a. Air Quality

The dust from the Black Rock Road, parking lots, and other roads would be reduced by spraying Magnesium Chloride on the smooth surface. The magnesium chloride would form a hard dust-free running surface.

b. Soil

The borrow pits would be sloped and shaped so the pits would appear a wide spot in a draw. Each borrow pit would be designed with a livestock/ wildlife pond in it which would catch precipitation runoff. The catchment ponds would be built so animals could enter the water, drink and safely exit. Once construction is completed and equipment is not disturbing the

soil all areas which are not occupied by roads, structures, parking lots, etc. would be seeded with the following mix:

SEED	POUNDS PER ACRE
Indian Ricegrass	1/2
Prostrate Kosha	1
Ephraim Crested Wheatgrass	3
Winterfat	1/2

This seed mix would not be used in areas of high salt concentration, i.e., on dikes or near the salt storage piles, but all viable areas, i.e., borrow pits, well field, powerline, etc. would be seeded.

Topsoil from the borrow pits would be stockpiled, then spread over the pits as part of the site rehabilitation.

Livestock Grazing

The Haden group has agreed to place a water tap in the process water line so BLM can supply water to livestock/wildlife. The Bureau would need to construct and maintain the livestock/wildlife water line. The water line would make water available so the existing unused forage could be used. So, in the final analysis, more livestock forage would become available for use for livestock/wildlife than before the project. Also, the material borrow pits would have livestock water ponds constructed in the bottom of each pit.

d. Wildlife

In order to supply habitat for the displaced antelope, a water tap would be placed in the Haden process water line. BLM could take this water to construct and maintain a livestock/wildlife water line. If W. D.

Haden does not go into operation, BLM wants to take over the well system to supply water to livestock/wildlife.

The displaced eagles which perch in the Black Rock Pass area would have new perches built as a part of the 46kV powerline. W. D. Haden would insure that eagle perches would be built every .5 mile along the powerline. The perches would be built in accordance with REA Bulletin 61-10, Figure 5. This construction would provide a safe roost for eagles.

e. Recreation and Visual

The visual intrusion of the collection ditches as seen from the highway would be reduced by not constructing the collection ditches any further north than necessary and the ditch berms north of the needle point dike would be spread out so they are fairly flat. The dikes throughout the project would be kept to a minimum height as needed for the project. Dikes, buildings and other structures would be built with materials and colors that blend with the surrounding landscape.

f. Cultural Resources

If previously unknown cultural values are discovered during construction (i.e., excavation) all work would stop and the District Archaeologist would be called to clear the problem.

3. Unavoidable Adverse Impacts

There would be some dust as the project is being built, and before the magnesium chloride is applied to the roads. There would also be about 40 tons/year of particulate emissions from the product dryers, and this would continue for the life of the project.

The recreation activities at the north end of the lake would possibly be adversely affected by the plant construction, and these activities, i.e., swimming, would be reduced or ended. The natural character of the lake would be lost and the ditch collection system would still be visible. People traveling the Black Rock Road would be able to see the plant as they travel past.

4. Relationship Between Short-Term Use of the Environment vs. Long-Term Productivity.

The short-term use of the proposal is to construct and operate a potassium sulfate extraction plant. Even if the operation continued for one or two hundred years, the salty nature of the area would not change and the productivity of the lake would not change.

5. Irreversible and Irretrievable Commitments of Resources

The irreversible commitment of resources in salt extraction process would be the materials to build and operate the plant, i.e., fuel for product dryers and manpower, but not other resources would be committed. There would be an irretrievable commitment of 100,000 tons of potassium sulfate each year. Proven potassium sulfate reserves on the lake bed on the top twenty feet of lake sediments exceed 10,000,000 tons Potassium sulfate reserves on the lake bed probably exceed 200,000,000 tons.

2. No Action Alternative

Do not permit construction.

a. Environmental Impacts

If the W. D. Haden proposal is denied, the project would not be constructed and there would not be any impact on the environment. But, Haden would be severely affected by the denial. To date, Haden has spent two and one-half million dollars in research and development, and the money would be lost. The primary pond dike would have to be dismantled and the material spread over the lake or hauled back to the borrow pit. The prospecting permits on lake would be lost and the project abandoned.

The potash and salt would not be harvested, and there are markets for these minerals. For example, in the past three years, Salt Lake County has not been able to find enough salt for snow and ice removal, and when the County could buy enough salt, the price was very high.

b. Mitigating Measures

There are no mitigating measures for the no action alternative.

c. Unavoidable Adverse Impacts

Same as anticipated impacts.

d. Relationship Between Short-Term Use of the Environment vs. Long-Term Productivity

There would not be any short-term use of the environment or long-term productivity.

e. Irreversible and Irretrievable Commitment of Resources

There would not be any natural resources committed, but a significant human and economic commitment has been made. Over the years, an unknown

number of work hours have been spent in research and development of the proposal. At the same time, $500,000 has been spent trying to assess whether the proposal is economically feasible.

F. PUBLIC INTEREST

To this time, there has been a great deal of interest in this action in Beaver and Millard Counties. All interest has been positive and favorable.

G. RECORD OF PERSONS, GROUPS, AND GOVERNMENTAL AGENCIES CONSULTED (or to be consulted)

U.S. Air Force

Beaver County

Millard County

Millard Planning and Zoning

Livestock Permittees

Utah State Planning and Budget

Utah State Engineer

Utah State Oil, Gas and Minerals

H. PARTICIPATING STAFF

See cover page.

REdmonds:ebk:Revision (2) 07/21/87
(3) 07/22/87
(4) 07/24/87
(5) 07/27/87
(6) 08/17/87
(Wang #0328G)

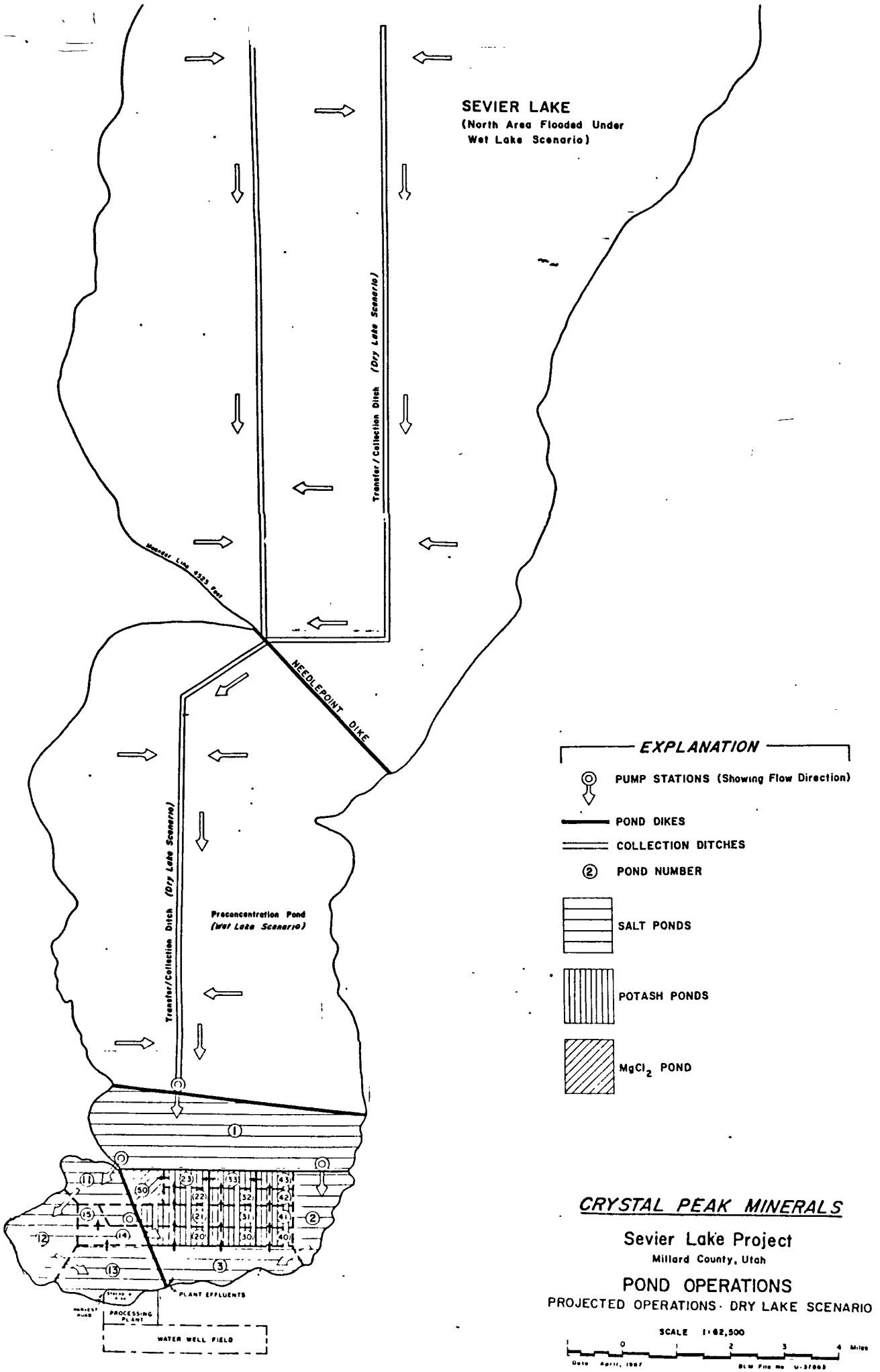
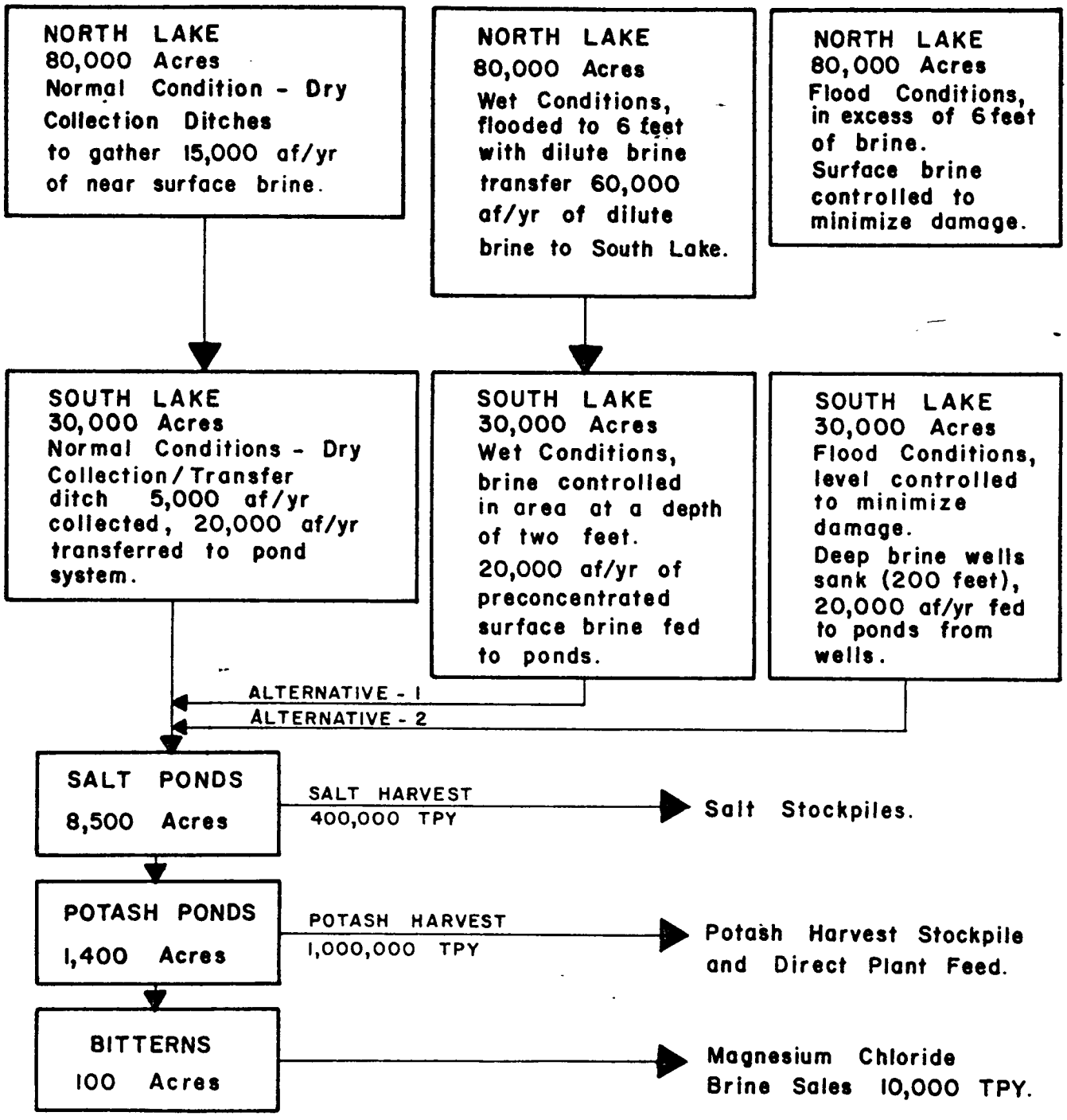

SEVIER LAKE
(North Area Flooded Under
Wet Lake Scenario)
Transfer / Collection Ditch (Dry Lake Scenario)
Makeup Line 4323 Feet
NEEDLEPOINT DIKE
Transfer/Collection Ditch (Dry Lake Scenario)
Preconcentration Pond
(Wet Lake Scenario)
PLANT EFFLUENTS
PROCESSING PLANT
WATER WELL FIELD
EXPLANATION
PUMP STATIONS (Showing Flow Direction)
POND DIKES
COLLECTION DITCHES
POND NUMBER
SALT PONDS
POTASH PONDS
MgCl2 POND
N
CRYSTAL PEAK MINERALS
Sevier Lake Project
Millard County, Utah
POND OPERATIONS
PROJECTED OPERATIONS - DRY LAKE SCENARIO
SCALE 1:62,500
0 1 2 3 4 Miles
Date April, 1987
BLM File No. U-37503
dwg by JEJ

FIG.



CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

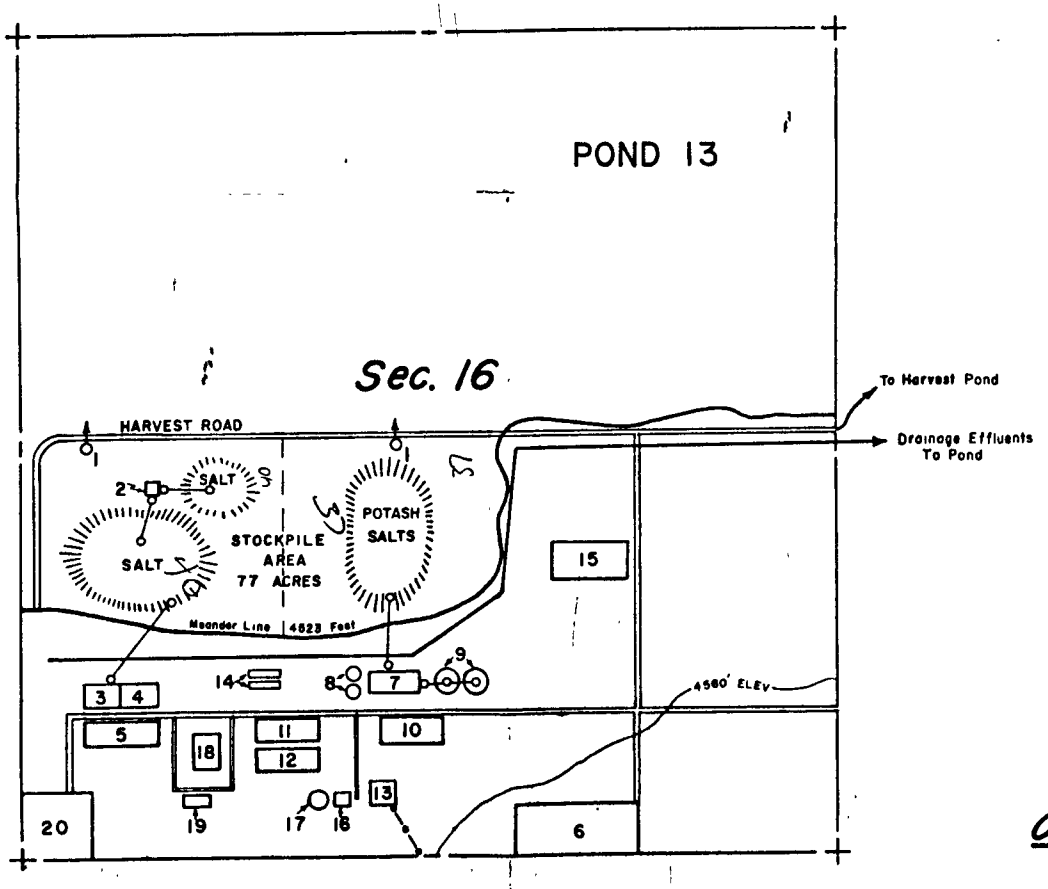
POND OPERATIONS

FIG. 2

DATE: April, 1987 BLM File No: U-37863 Dwg by: B. Mc

R 12 W

T 24 S



EXPLANATION

1 - STOCKPILE DRAINAGE PUMPS.
2 - SALT WASHING/STACKING STATION.
3 - SALT DRYING / BAGGING PLANT.
4 - SALT WAREHOUSE / LOADOUT.
5 - SALT PLANT PARKING LOT.
6 - GRAVEL PIT.
7 - K_2SO_4 PLANT.
8 - THICKENERS.
9 - K_2SO_4 BULK STORAGE / LOADOUT.
10 - K_2SO_4 PLANT PARKING LOT.
11 - OFFICE PARKING LOT.
12 - OFFICE/MAINTENECE/TECHNICAL SERVICES BLDG.
13 - POWER SUBSTATION.
14 - PROPANE STORAGE.
15 - SEWAGE TREATMENT AND LAGOON.
16 - WATER TREATMENT PLANT.
17 - WATER TANK.
18 - MOBILE EQUIPMENT SHOP.
19 - FUEL TANKS.
20 - SANITARY LANDFILL.

LEGEND

BELT CONVEYOR
ROADS
POWER LINES
STOCKPILE

N

CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

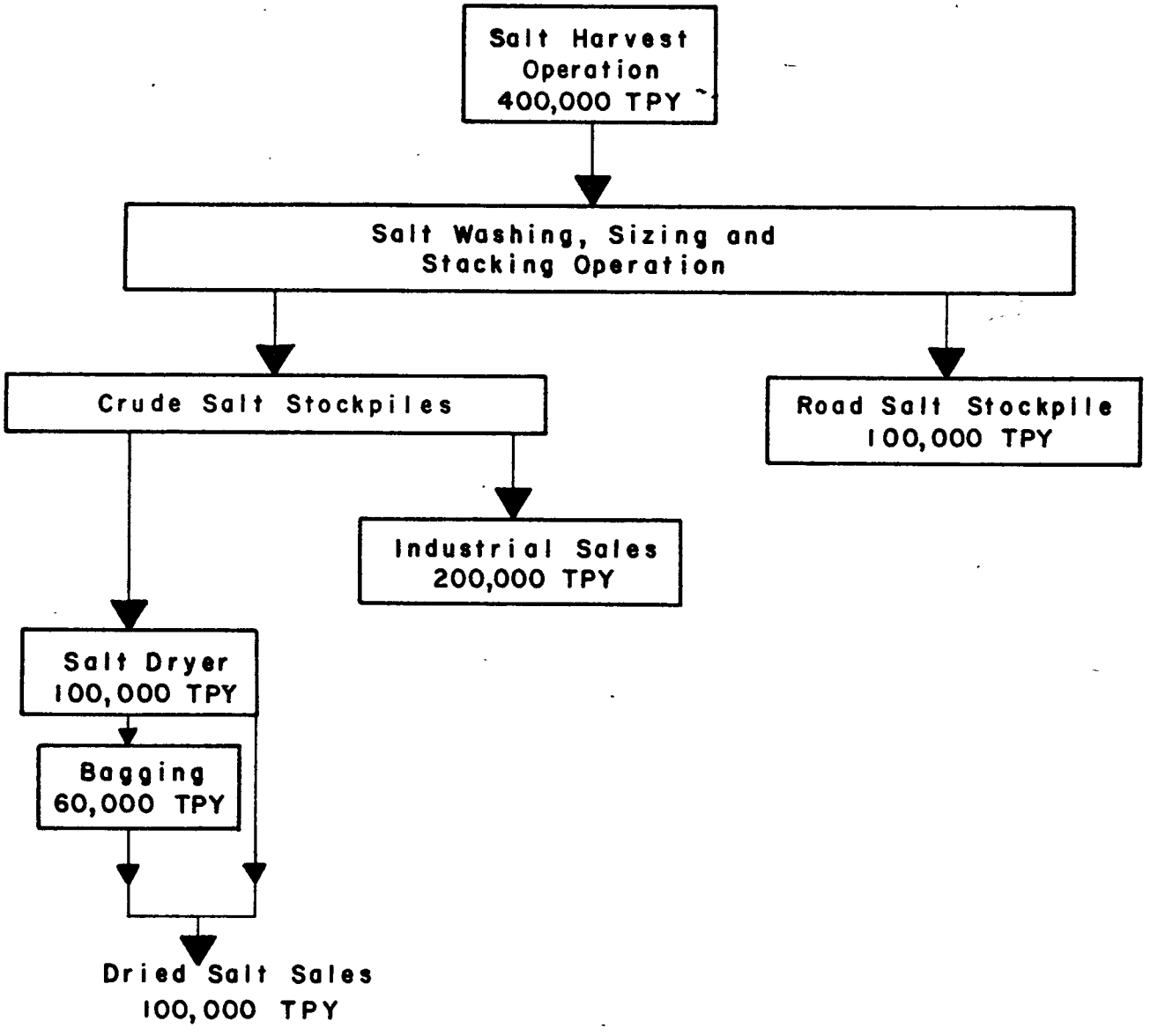
PROCESSING PLANT LAYOUT

800 0 800 Ft.

DATE: APRIL, 1987 BLM FILE No: U-37663

FIG. 3

DWG By



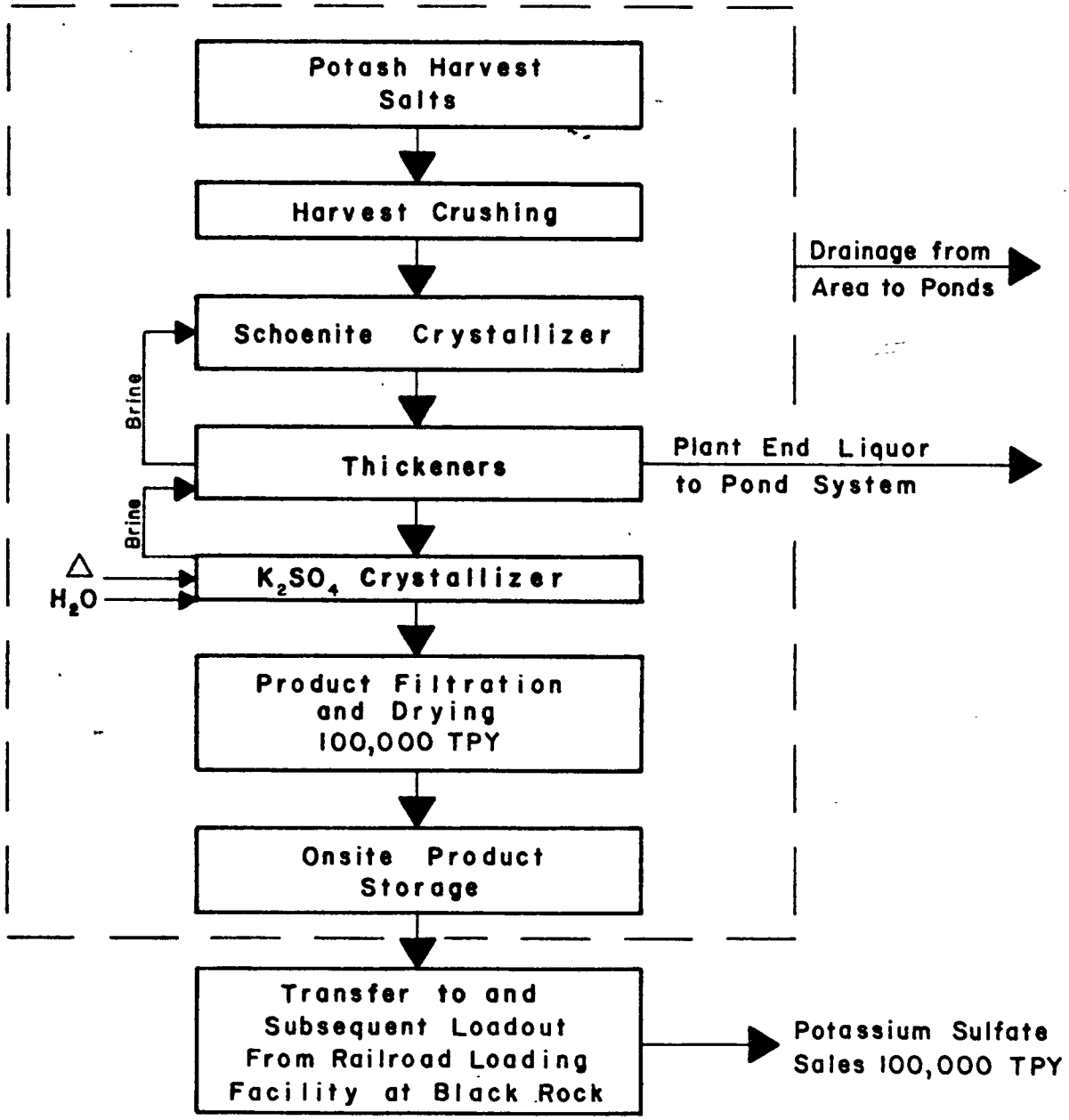
CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

FIG. 4 SODIUM CHLORIDE PLANT OPERATIONS

Dwg. by: B Mau DATE: April, 1987 BLM File No.: U-37863



CRYSTAL PEAK MINERALS

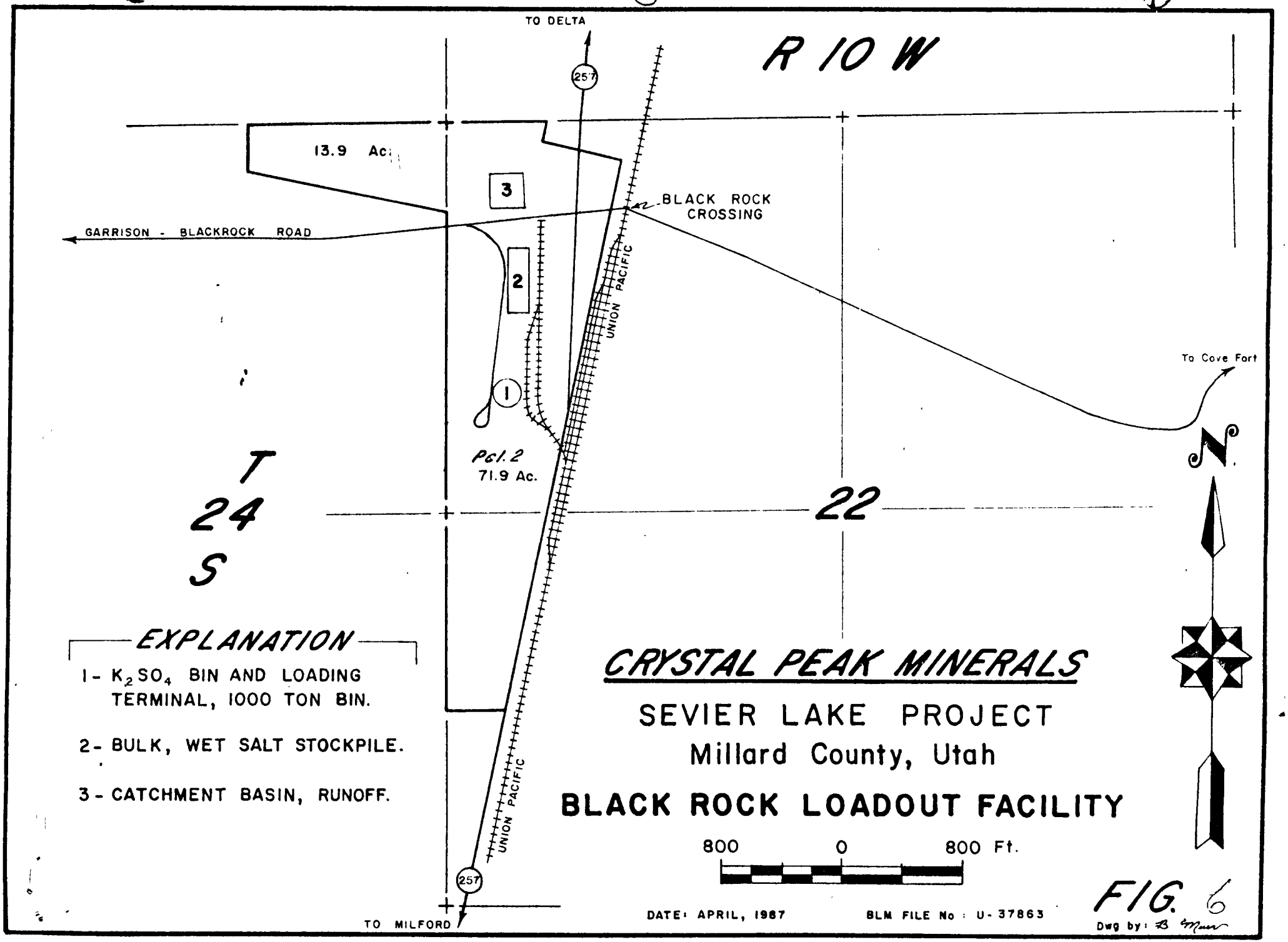
SEVIER LAKE PROJECT

Millard County, Utah

POTASSIUM SULFATE PLANT OPERATIONS

FIG. 5

DATE: April, 1987 BLM File No: U-37863 Dwg. by: B. Miner


TO DELTA
R 10 W
257
13.9 Ac.
3
BLACK ROCK CROSSING
GARRISON - BLACKROCK ROAD
2
UNION PACIFIC
To Cove Fort
1
Pcl. 2
71.9 Ac.
T 24 S
22
EXPLANATION
1 - K_2SO_4 BIN AND LOADING TERMINAL, 1000 TON BIN.
2 - BULK, WET SALT STOCKPILE.
3 - CATCHMENT BASIN, RUNOFF.
CRYSTAL PEAK MINERALS
SEVIER LAKE PROJECT
Millard County, Utah
BLACK ROCK LOADOUT FACILITY
800 0 800 Ft.
257
TO MILFORD
DATE: APRIL, 1987
BLM FILE No : U-37863
FIG. 6
Dwg by: B

ENDANGERED, THREATENED, & SENSITIVE PLANT CLEARANCE

DATE 2/20/87 Examiner Gerald Muhlestein

PROJECT NAME H G Group of Unpatented Mining Claims - UT 057-4P

PROJECT LOCATION: T. 24 S , R. 12 W , Sec. 22 , NW ¼ NW ¼

ELEVATION 4600 GEOLOGY Alluvium

SWA # VEGETATIVE TYPE Desert shrub-grass

DESCRIPTION OF FIELD WORK: Removal of 50,000 cu. yds. material

REFERENCE SOURCES: Resource Library

GENERAL COMMENTS:

THREATENED, ENDANGERED, OR SENSITIVE PLANTS: YES NO X

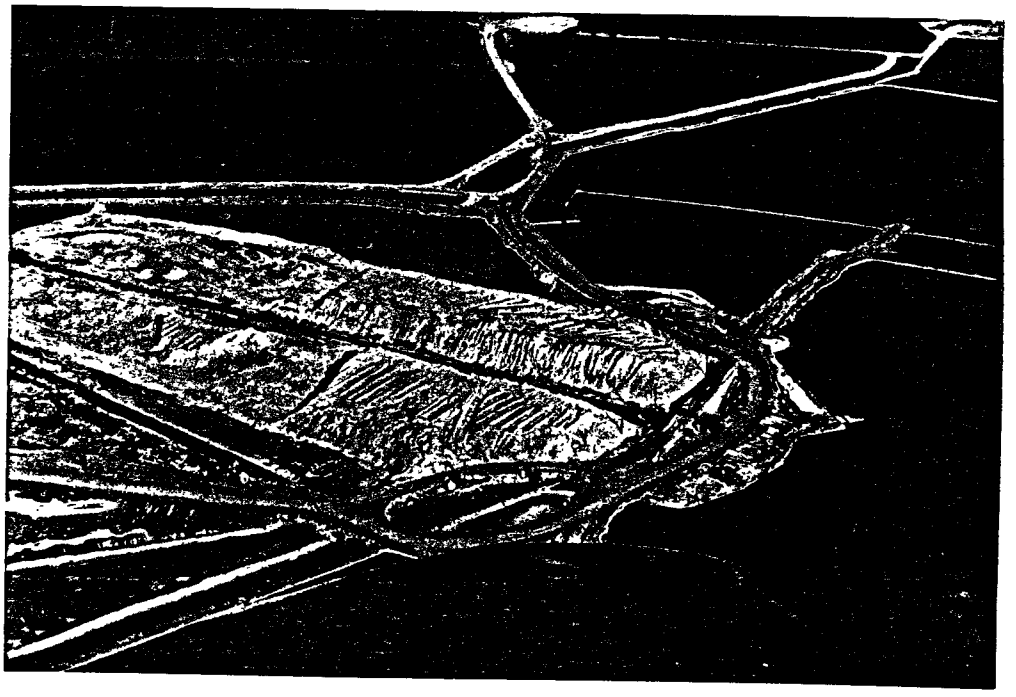
(List if YES)

*PLANTS COLLECTED ON SITE: None

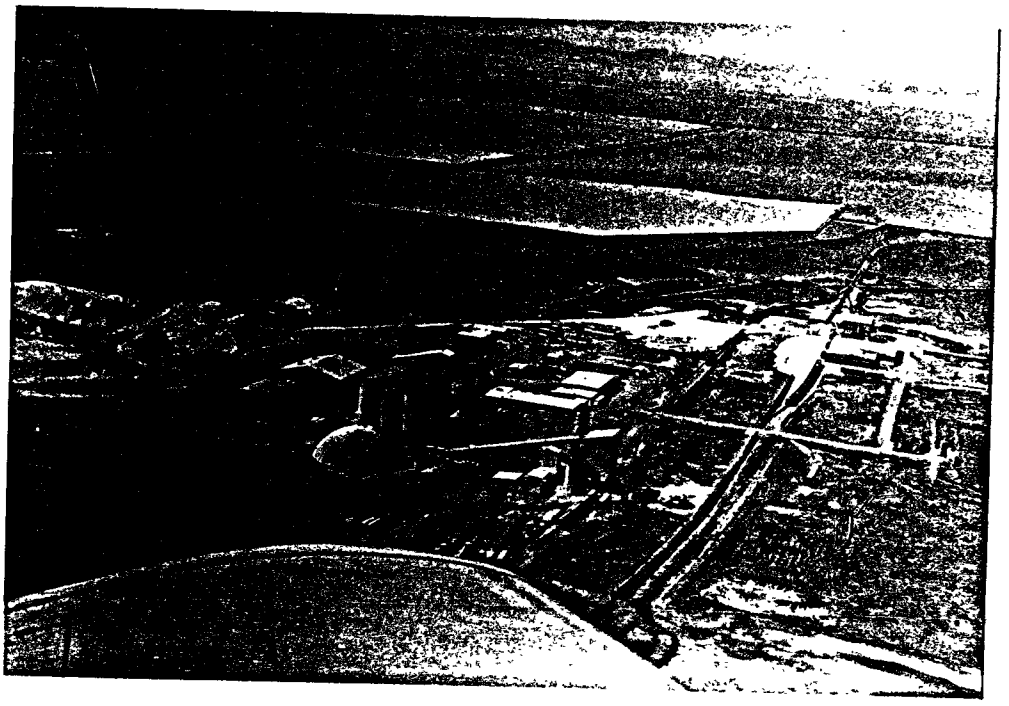
*PLANTS OBSERVED ON SITE: Hilaria jamesii, Oryzopsis hymenoides, Sitanion hystrix, Bromus tectorum, Artemisia spinescens, Atriplex confertifolia, Chrysothamnus nauseosus, Eurotia lanata, Gutierrezia sarothrae, Ephedra spp., Opuntia spp., Sphaeralcea spp.

*Plant Abundance (a) - abundant (c) - common (i) - infrequent

PHOTO# 1 Pond,dike, and canal system



PHOTO# 2 Material storage piles and ponds



PHOTO# 3 Processing plant and associated facilities

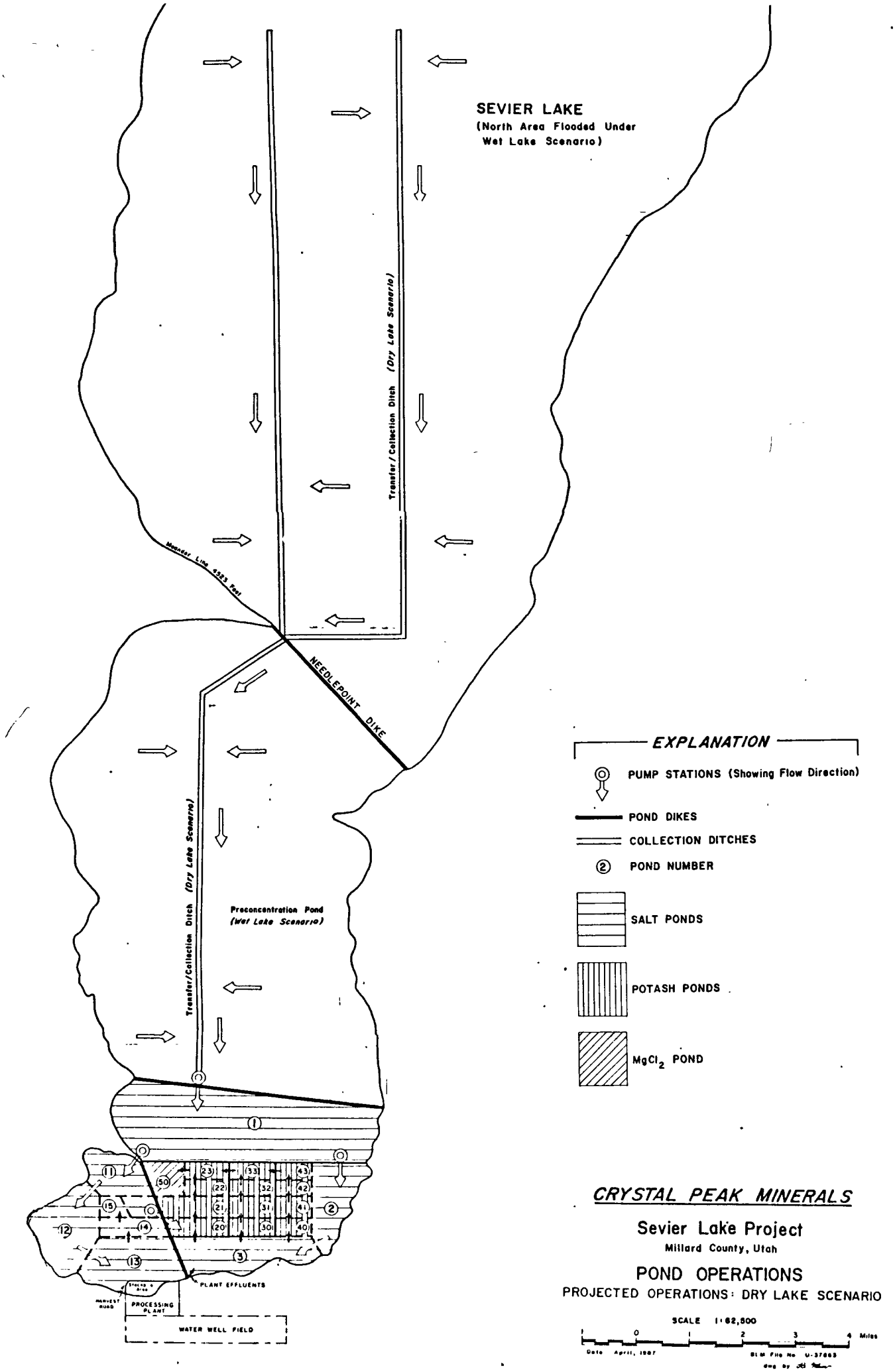
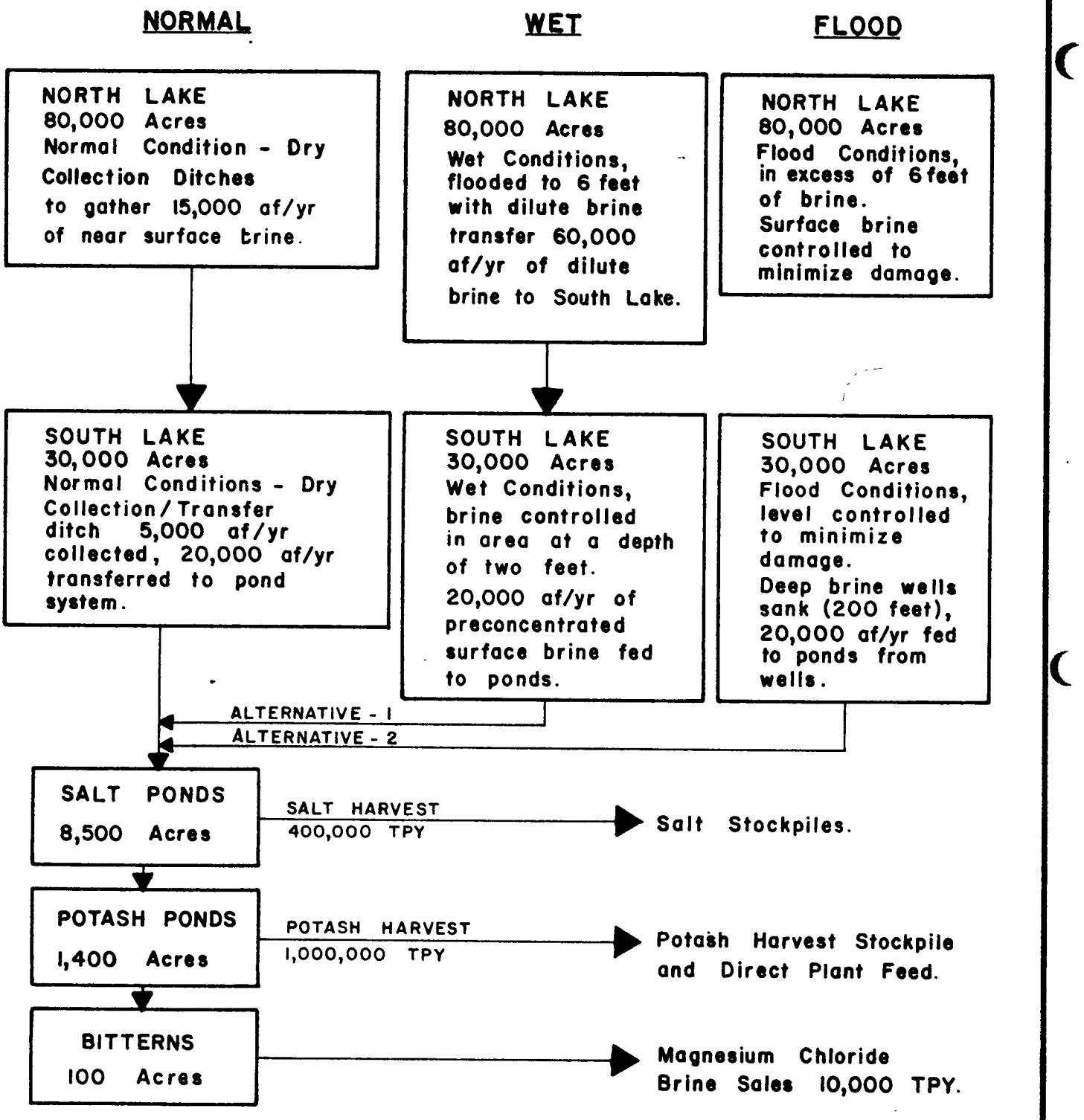

SEVIER LAKE
(North Area Flooded Under
Wet Lake Scenario)
Transfer/Collection Ditch (Dry Lake Scenario)
Meander Line 4523 Feet
NEEDLEPOINT DIKE
Transfer/Collection Ditch (Dry Lake Scenario)
Preconcentration Pond
(Wet Lake Scenario)
PLANT EFFLUENTS
PROCESSING PLANT
WATER WELL FIELD
EXPLANATION
PUMP STATIONS (Showing Flow Direction)
POND DIKES
COLLECTION DITCHES
POND NUMBER
SALT PONDS
POTASH PONDS
MgCl2 POND
CRYSTAL PEAK MINERALS
Sevier Lake Project
Millard County, Utah
POND OPERATIONS
PROJECTED OPERATIONS: DRY LAKE SCENARIO
SCALE 1:62,500
0 1 2 3 4 Miles
Date April, 1987
BLM File No U-37663
N

FIG.



CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

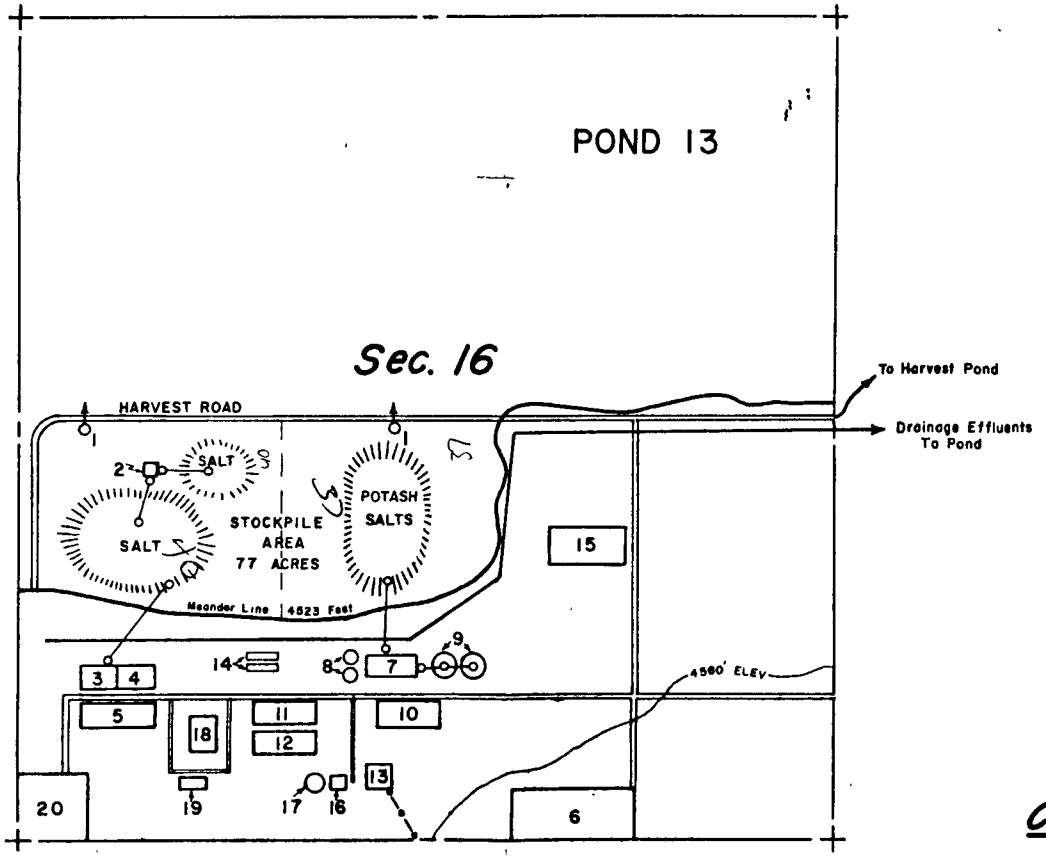
POND OPERATIONS

FIG. 2

DATE: April, 1987 BLM File No: U-37863 Dwg by: B. Mur

R 12 W

T 24 S



EXPLANATION

1 - STOCKPILE DRAINAGE PUMPS.
2 - SALT WASHING/STACKING STATION.
3 - SALT DRYING / BAGGING PLANT.
4 - SALT WAREHOUSE / LOADOUT.
5 - SALT PLANT PARKING LOT.
6 - GRAVEL PIT.
7 - K_2SO_4 PLANT.
8 - THICKENERS.
9 - K_2SO_4 BULK STORAGE / LOADOUT.
10 - K_2SO_4 PLANT PARKING LOT.
11 - OFFICE PARKING LOT.
12 - OFFICE/MAINTENECE/TECHNICAL SERVICES BLDG.
13 - POWER SUBSTATION.
14 - PROPANE STORAGE.
15 - SEWAGE TREATMENT AND LAGOON.
16 - WATER TREATMENT PLANT.
17 - WATER TANK.
18 - MOBILE EQUIPMENT SHOP.
19 - FUEL TANKS.
20 - SANITARY LANDFILL.

LEGEND

- BELT CONVEYOR
- ROADS
- POWER LINES
- STOCKPILE

CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

PROCESSING PLANT LAYOUT

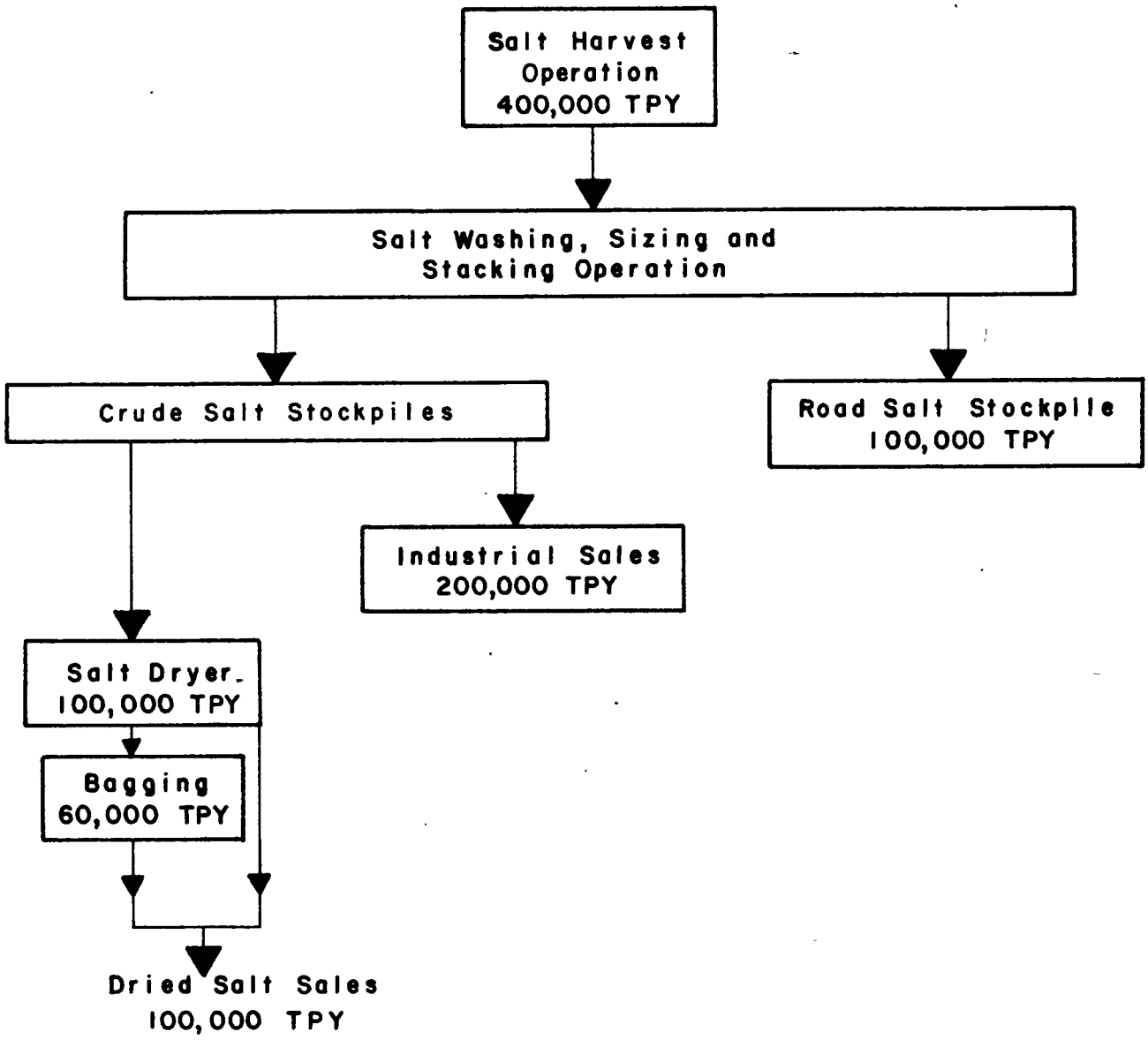
800 0 800 Ft.

DATE: APRIL, 1987 BLM FILE No: U-37965

N

FIG. 3

DWG By: B Mann



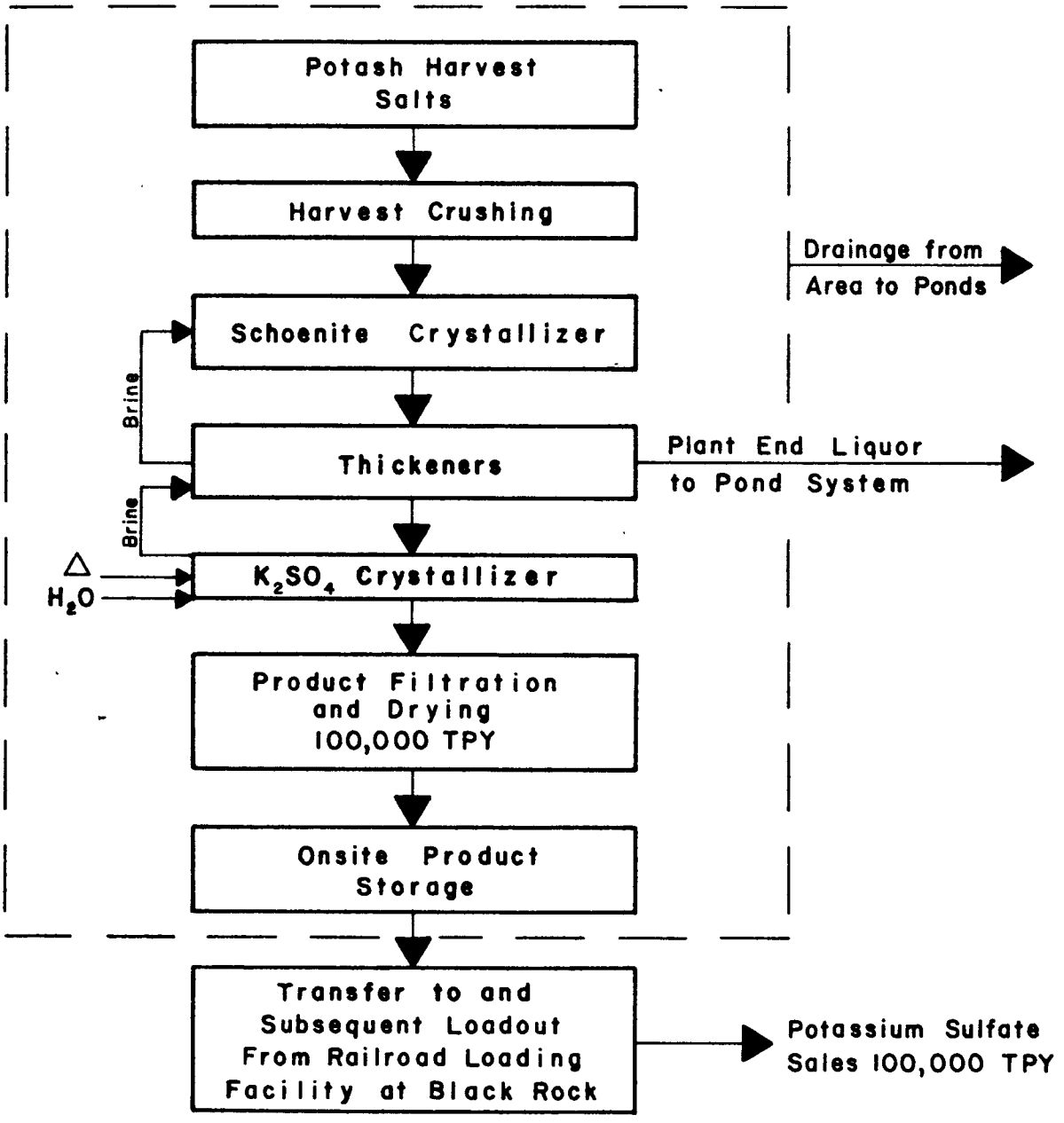
CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

FIG. 4 SODIUM CHLORIDE PLANT OPERATIONS

Dwg. by: B Mur DATE: April, 1987 BLM File No.: U-37863



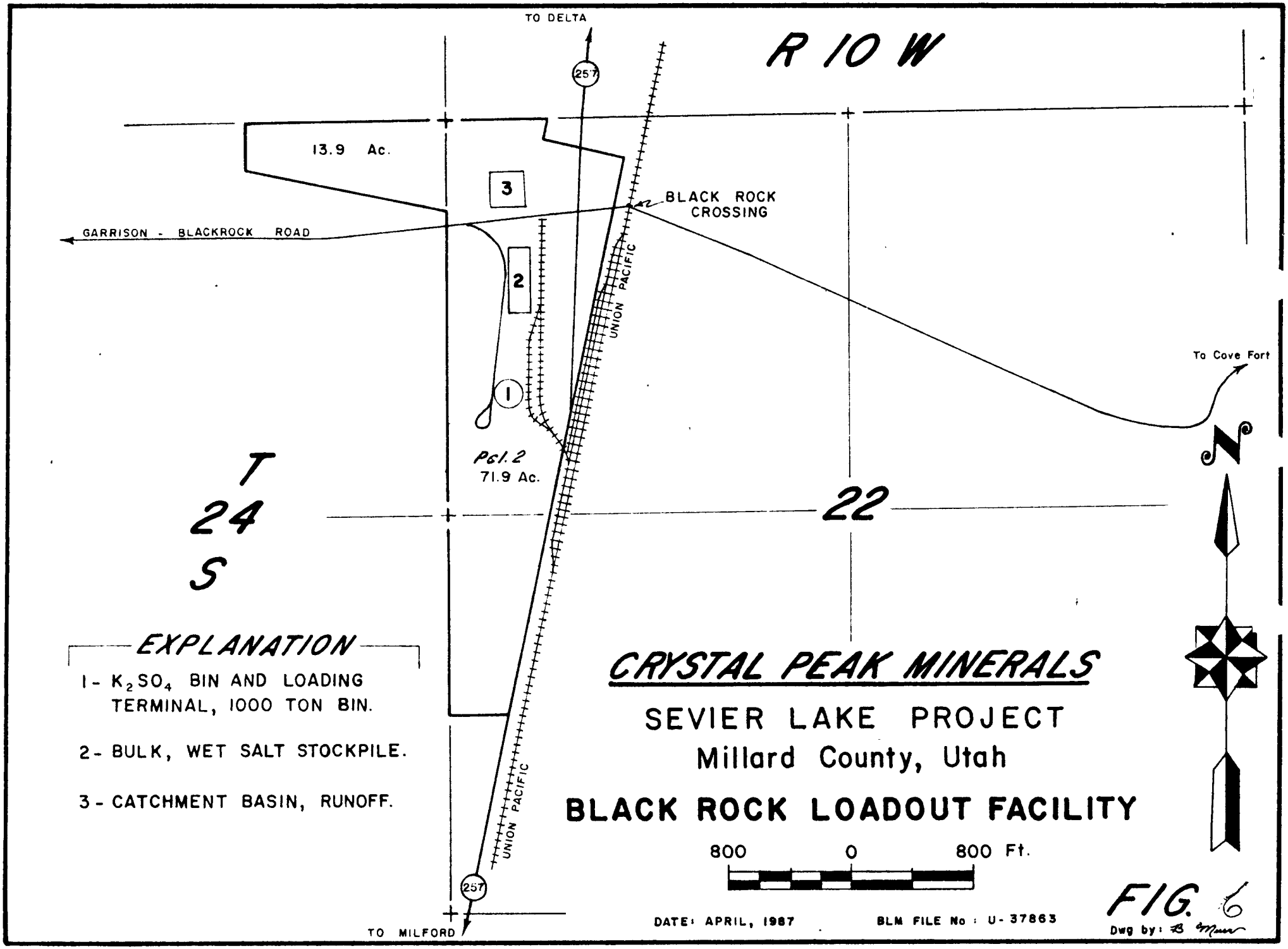
CRYSTAL PEAK MINERALS

SEVIER LAKE PROJECT

Millard County, Utah

POTASSIUM SULFATE PLANT OPERATIONS FIG. 5

DATE: April, 1987 BLM File No: U-37863 Dwg. by: B. Muir


TO DELTA
R 10 W
257
13.9 Ac.
3
BLACK ROCK CROSSING
GARRISON - BLACKROCK ROAD
2
UNION PACIFIC
To Cove Fort
1
Pct. 2
71.9 Ac.
T
24
S
22
EXPLANATION
1 - K_2SO_4 BIN AND LOADING TERMINAL, 1000 TON BIN.
2 - BULK, WET SALT STOCKPILE.
3 - CATCHMENT BASIN, RUNOFF.
CRYSTAL PEAK MINERALS
SEVIER LAKE PROJECT
Millard County, Utah
BLACK ROCK LOADOUT FACILITY
800 0 800 Ft.
257
TO MILFORD
DATE: APRIL, 1987
BLM FILE No : U-37863
FIG. 6
Dwg by: B Mann

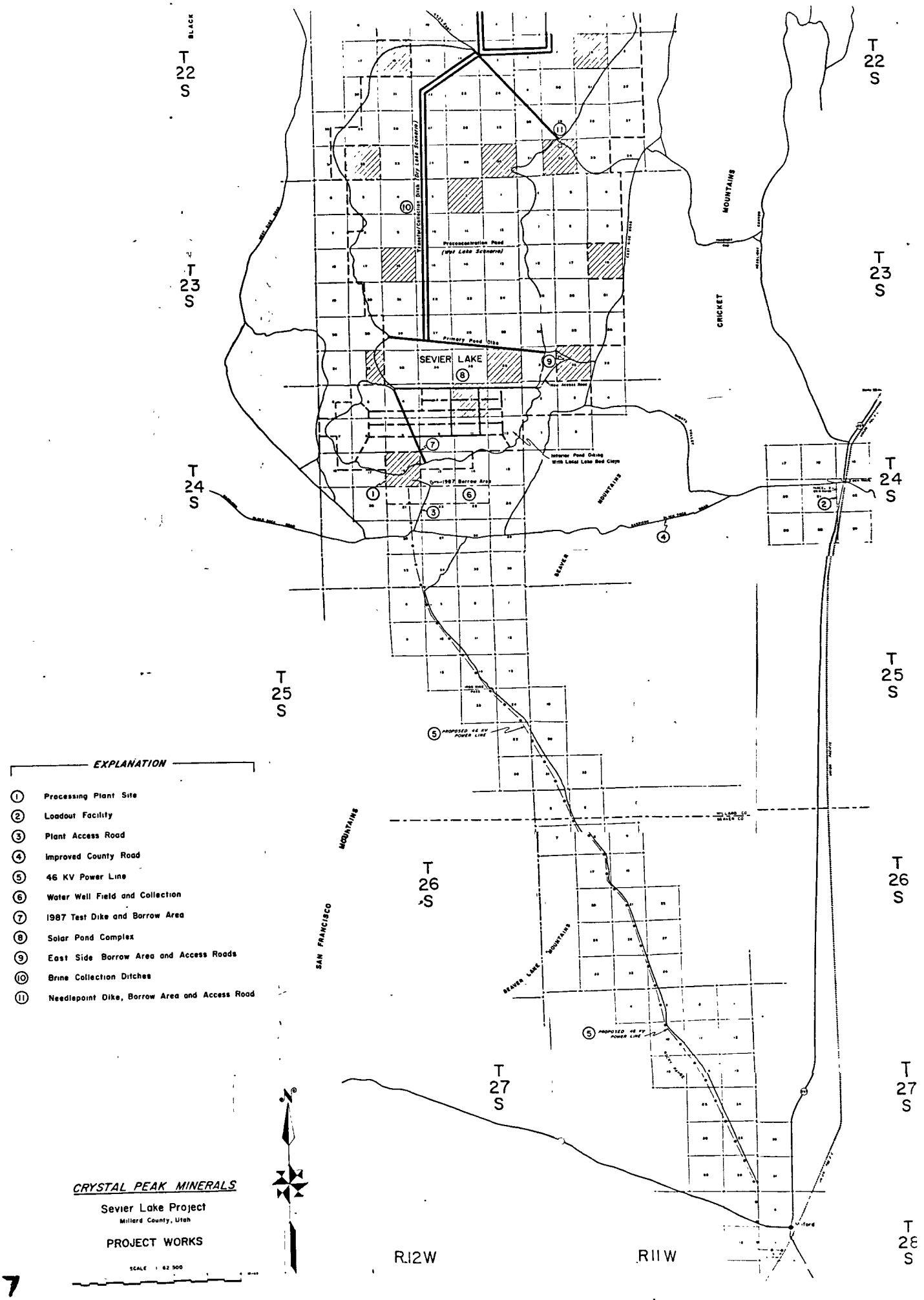

T 22 S
T 23 S
T 24 S
T 25 S
T 26 S
T 27 S
T 28 S
R.12W
R.11W
SEVIER LAKE
CRICKET MOUNTAINS
BEAVER MOUNTAINS
SAN FRANCISCO MOUNTAINS
BLACK MOUNTAINS
Primary Pond Dike
Interior Pond Dike with Local Lake Bed Clays
1987 Borrow Area
Proposed 46 KV Power Line
EXPLANATION
1 Processing Plant Site
2 Loadout Facility
3 Plant Access Road
4 Improved County Road
5 46 KV Power Line
6 Water Well Field and Collection
7 1987 Test Dike and Borrow Area
8 Solar Pond Complex
9 East Side Borrow Area and Access Roads
10 Brine Collection Ditches
11 Needlepoint Dike, Borrow Area and Access Road
CRYSTAL PEAK MINERALS
Sevier Lake Project
Millard County, Utah
PROJECT WORKS
SCALE 1 62 500

FIG 7

ENDANGERED, THREATENED, & SENSITIVE PLANT CLEARANCE

DATE 2/20/87 Examiner Gerald Muhlestein

PROJECT NAME H G Group of Unpatented Mining Claims - UT 057-4P

PROJECT LOCATION: T. 24 S , R. 12 W , Sec. 22 , NW ¼ NW ¼

ELEVATION 4600 GEOLOGY Alluvium

SWA # VEGETATIVE TYPE Desert shrub-grass

DESCRIPTION OF FIELD WORK: Removal of 50,000 cu. yds. material

REFERENCE SOURCES: Resource Library

GENERAL COMMENTS:

THREATENED, ENDANGERED, OR SENSITIVE PLANTS: YES NO X

(List if YES)

*PLANTS COLLECTED ON SITE: None

*PLANTS OBSERVED ON SITE: Hilaria jamesii, Oryzopsis hymenoides, Sitanion hystrix, Bromus tectorum, Artemisia spinescens, Atriplex confertifolia, Chrysothamnus nauseosus, Eurotia lanata, Gutierrezia sarothrae, Ephedra spp., Opuntia spp., Sphaeralcea spp.

*Plant Abundance (a) - abundant (c) - common (i) - infrequent

U.S.
Department of the Interior
Bureau of Land Management
Richfield District Office

Project Number: U87BL129b

Summary Report of
Inspection for Cultural Resources

1. Report Title: Sevier Lake Minerals Exploration

2. Development Company: W. D. Hayden Co.

3. Report Date: March 23, 1987 4. Inventory Date: Feb. 20, 1987

5. Resource Area: Warm Springs 6. County: Millard

7. Fieldwork Location: Map Reference: Beaver Lake Mountains
TWN 24S Range 12W Section(s) 4,_9,_10,_15,_16
TWN _____ Range _____ Section(s) _____
TWN _____ Range _____ Section(s) _____

8. Description of Project Proposal:
Construction of a dike, two wells, a camping area and improved road access.

9. Description of Examination Procedures:
Area to be disturbed was examined using parallel transects approximately 15 meters apart.

10. Linear Miles Surveyed: 1
and/or
Definable Acres Surveyed: _____
and\or
*Legally Undefinable Acres Surveyed: 10
(*A parcel hard to cadastrally locate, i.e., the center of a section.)

11. Inventory Type: I
R = Reconnaissance
I = Intensive
S = Statistical Sample

12. Description of Findings (attach appendices, if appropriate):
No sites or isolated artifacts were recorded.

13. Number Sites Found: 0 14. Collection: No

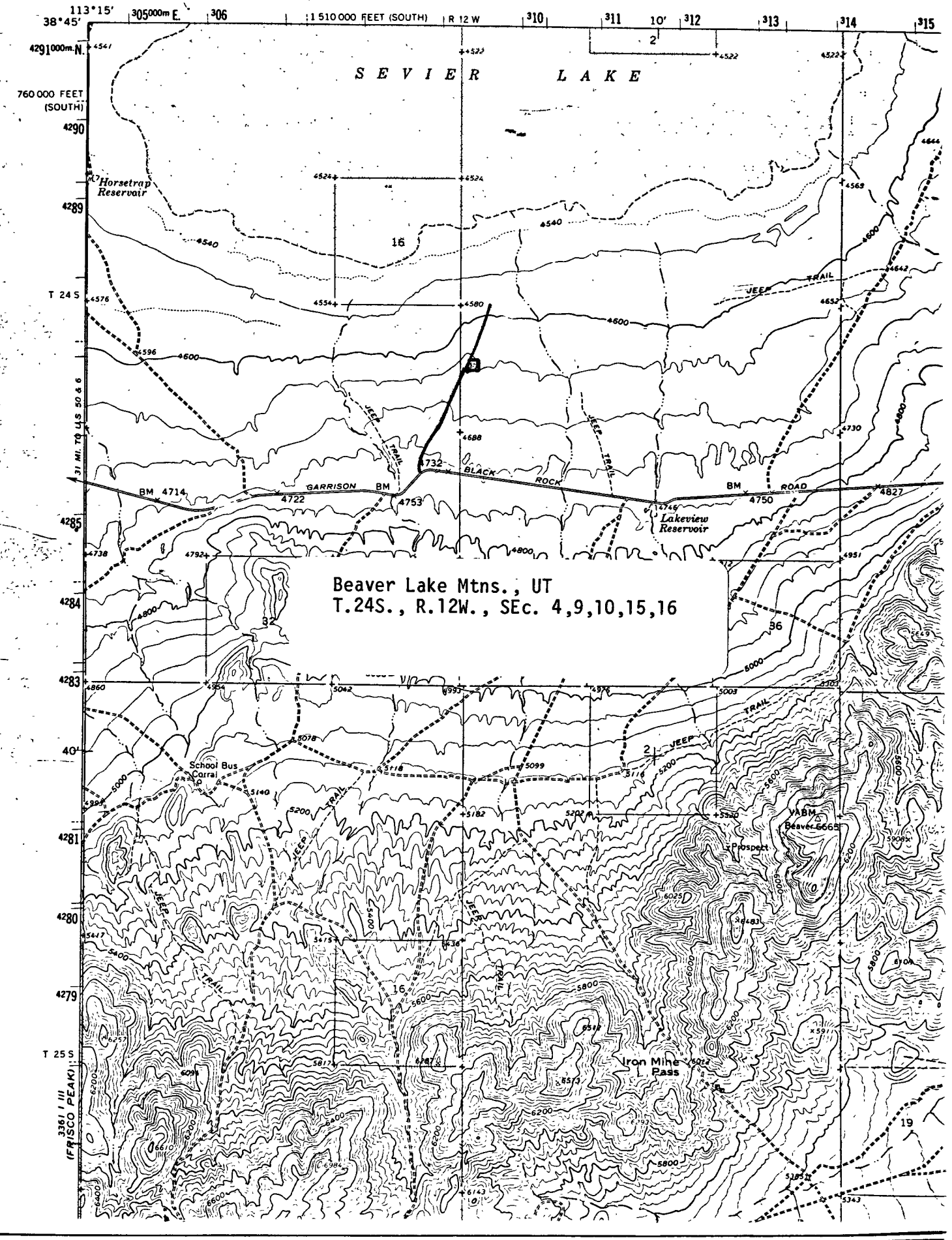
15. Actual/Potential National Register Properties Affected:
None

16. Literature Search, Location/Date:
Richfield District Office, March 23, 1987

17. Conclusion/Recommendations:
Proceed with the project. See attached standard stipulations.

18. Signature: Craig B. Harmon Date: March 23, 1987
Archaeologist

8100-3


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
(THE BARN)
113°15'
38°45'
305000m E.
306
1 510 000 FEET (SOUTH)
R 12 W
310
311
10'
312
313
314
315
4291000m N.
760 000 FEET (SOUTH)
SEVIER LAKE
Horsetrap Reservoir
T 24 S
31 MI. TO US 50 & 6
BM 4714
GARRISON
BM 4722
BM 4753
BLACK ROCK
BM 4750
ROAD
Lakeview Reservoir
JEEP TRAIL
School Bus Corral
Prospect
VABM Beaver 6665
Iron Mine Pass
T 25 S
(FRISCO PEAK)
Beaver Lake Mtns., UT
T.24S., R.12W., SEc. 4,9,10,15,16

Standard Stipulations

A. All vehicle traffic will be confined to existing roads and surveyed areas.

B. Personnel will refrain from collecting artifacts and otherwise disturbing cultural resources in the vicinity.

C. Should subsurface cultural resources be discovered during construction, construction will cease and the District Manager will be notified immediately. The cultural resource(s) will be evaluated and mitigated as necessary.

D. Should it be necessary to deviate from the defined right-of-way, a cultural resource investigation will be conducted prior to disturbance.

U.S.
Department of the Interior
Bureau of Land Management
Richfield District Office
Summary Report of
Inspection for Cultural Resources

Project Number: U87BL508b

1. Report Title: Sevier Lake Minerals Road Upgrade
2. Development Company: Crystal Peak Minerals
3. Report Date: August 7, 1987 4. Inventory Date: July 31, 1987
5. Resource Area: Warm Springs 6. County: Millard
7. Fieldwork Location: Map Reference: Beaver Lake Mountains, UT
   TWN 24S Range 12W Section(s) 28, 27, 26, 25
   TWN 24S Range 11W Section(s) 30, 29, 28, 27, 26, 23, 24
   TWN 24S Range 10W Section(s) 19, 20, 21, 22
8. Description of Project Proposal:
   13.5 miles of road from Black Rock Siding to Sevier Lake will be widened to improve access for the Crystal Peak Minerals operations at the lake. The road would have a 50' right of way.
9. Description of Examination Procedures:
   The proposd route was covered on a motorcycle. A zig-zag pattern was used on each side of the road. Average speed approximately 15 mph.
10. Linear Miles Surveyed: 13.5
    and/or
    Definable Acres Surveyed:
    and\or
    *Legally Undefinable Acres Surveyed:
    (*A parcel hard to cadastrally locate, i.e., the center of a section.)
11. Inventory Type: I
    R = Reconnaissance
    I = Intensive
    S = Statistical Sample
12. Description of Findings (attach appendices, if appropriate):
    One site was found and recorded, 42MD898, an insignificant lithic scatter. Two other sites, 42MD103 and 42MD380, may also be affected by the road work. These are both insignificant lithic scatters.
13. Number Sites Found: 1
14. Collection: No
15. Actual/Potential National Register Properties Affected:
    None
16. Literature Search, Location/Date:
    Richfield District Office, 8-7-87
17. Conclusion/Recommendations:
    Proceed with the project. See attached standard stipulations.
18. Signature: Craig B. Harmon Date: August 17, 1987
    Archaeologist

8100-3

Standard Stipulations

A. All vehicle traffic will be confined to existing roads and surveyed areas.

B. Personnel will refrain from collecting artifacts and otherwise disturbing cultural resources in the vicinity.

C. Should subsurface cultural resources be discovered during construction, construction will cease and the District Manager will be notified immediately. The cultural resource(s) will be evaluated and mitigated as necessary.

D. Should it be necessary to deviate from the defined right-of-way, a cultural resource investigation will be conducted prior to disturbance.

ENDANGERED, THREATENED, & SENSITIVE PLANT CLEARANCE

DATE 2/20/87 Examiner Gerald Muhlestein

PROJECT NAME H G Group of Unpatented Mining Claims - UT 057-4P

PROJECT LOCATION: T. 24 S , R. 12 W , Sec. 22 , NW ¼ NW ¼

ELEVATION 4600 GEOLOGY Alluvium

SWA # VEGETATIVE TYPE Desert shrub-grass

DESCRIPTION OF FIELD WORK: Removal of 50,000 cu. yds. material

REFERENCE SOURCES: Resource Library

GENERAL COMMENTS:

THREATENED, ENDANGERED, OR SENSITIVE PLANTS: YES NO X

(List if YES)

*PLANTS COLLECTED ON SITE: None

*PLANTS OBSERVED ON SITE: Hilaria jamesii, Oryzopsis hymenoides, Sitanion hystrix, Bromus tectorum, Artemisia spinescens, Atriplex confertifolia, Chrysothamnus nauseosus, Eurotia lanata, Gutierrezia sarothrae, Ephedra spp., Opuntia spp., Sphaeralcea spp.

*Plant Abundance (a) - abundant (c) - common (i) - infrequent